

An Epigraphical Note on Palm-leaf, Paper and Birch-bark.—By

A. F. RUDOLF HOERNLE, PH.D., C.I.E.

[Read May, 1898.]

In his admirable summary of Indian Palæography which forms a part of the Encyclopædia of Indo-Aryan Research, the late Professor Bühler says (I translate from the German) that "it cannot be doubted but that the two large-leaved palms, the *tādātāla* (*Borassus flabelliformis*) and the *tādītālī* (*Corypha umbraculifera*, *C. taliera*) which probably were originally indigenous in South-India, but have now spread into the Panjāb, are those the leaves of which were principally employed" in India as writing-material (see § 37, C.). This statement, which merely repeats a general, oft-repeated opinion, is not quite accurate and therefore apt to mislead. It conveys the impression as if the leaves of those two palms had been used contemporaneously and indifferently throughout India. This is not correct. In preparing the introduction to my edition of the Bower Manuscript, I had occasion to specially enquire into this point. In the result I found (1) that up to a certain point of time, *Corypha umbr.* was the only palm, the leaves of which were used throughout India, and (2) that the use of the leaves of *Borassus fl.* commenced at a comparatively late period, and was, and is still, limited to the South and East of India. In the sequel I will try to show this. There are some minor inaccuracies in the above-quoted statement, which the following explanation will also set right.

The two Indian palms, which alone come into question in this connection, are (1) the (true) Talipat palm, *Corypha umbraculifera*, also *C. Taliera*; and (2) the Palmyra palm or Tarigach, *Borassus flabellifer*.¹

¹ In Bengal the *Corypha umbr.* is called *Tedēl*, while the *Borassus fl.* is called *Tāl*, and the proportion of the two palms is about 1 : 1000. The correct name of the *Borassus*, as Dr. Prain, the Superintendent of the Royal Botanic Gardens in Sibpur, informs me, is not *flabelliformis*, as usually given, but *flabellifer*, this being the name given to the palm by *Linnaeus* who first determined it. There is every

The former grows *wild* in Ceylon and on the Malabar coast, up to about the 13th Lat.; thence it freely grows *cultivated* up the west coast as far as the Concan (16th Lat.), and much less so as far as Bombay (19th Lat.); it also grows (but very uncommonly) *cultivated* up the whole of the East coast into Lower Bengal. It does not grow anywhere in the central part, or the high-lands of Southern India.

The *Borassus fl.* does not grow *wild* anywhere in India, but only *cultivated*, near villages. It grows throughout India, excepting only the Panjāb, Upper Sindh, and the northern-most portions of Rājputānā and of the North-West Provinces. In fact, its northern limit is (about) the 27th or 28th Lat.

The difference between these two palms is that whereas *Corypha umbr.* is *indigenous* to (Southern) India, *Borassus fl.* is an *introduced* tree, having been brought in from Africa, where it grows wild and is called *Deleb.* The above statements sum up the botanical information of the present day, which has been verified afresh for the purpose of the present paper by Dr. Prain, Superintendent of the Royal Botanic Gardens in Sibpur, near Calcutta.² For his assistance, most kindly and readily given, in all matters touching the botany of these palms, I wish here to express my sincere thanks.

The leaves of the two palms can be easily distinguished from one another. Those of the *Corypha umbr.* are thinner and broader than those of the *Borassus fl.*; they also possess clearly marked cross-veins, in the form of rills, while the *Borassus* leaves rather present a pitted or pock-marked appearance. The width of the *Borassus* leaf never exceeds $1\frac{3}{4}$, and very rarely exceeds $1\frac{1}{2}$ inches. Among all the cases that I have actually measured I have found the latter width only exceeded in three cases. These are No. 40 in Table II which measures $1\frac{5}{8}$ inches, and Nos. 20 and 42 in Table II, which measure $1\frac{9}{16}$ inches; all three being Southern Indian manuscripts. The majority of the *Borassus* manuscripts are something less than $1\frac{1}{2}$ inches wide. A width of less than one inch is very rare; I have only met with it in two Southern Indian manuscripts, *viz.*, Nos. 18 and 37 in Table II, which measure only $1\frac{5}{16}$ of an inch.

The usual width of the *Corypha* leaf varies between $1\frac{3}{4}$ and 3 inches. Among the inscribed leaves examined by myself, I have not

reason to believe that *C. Taliera* and *C. umbraculifera* are identical. I understand that Dr. Prain is preparing a monograph on the subject of these palms.

² I should add, however, that, as I understand, more recent enquiries, made by Dr. Prain seem to render it doubtful whether even the *Corypha umbr.* grows *wild* anywhere in India or Ceylon. A very puzzling question then arises as to the real original home of that palm.

met with any wider than $2\frac{1}{3}$ inches; though a few manuscripts which I have not seen are said to exist of the width of 3 inches (see Table III, No. 83). Manuscripts under $1\frac{3}{4}$ inches wide are uncommon: instances are Nos. 15, 48, 57, 64 and 67 in Table I, and Nos. 4 and 8 in Table II. A width of less than $1\frac{1}{2}$ inches is very exceptional. I have only found three cases, among all the manuscripts which I have measured; *viz.*, No. 12 in Table II which is $1\frac{2}{3}$ of an inch wide, and No. 55 in Table I and No. 5 in Table II, which are as low as $1\frac{1}{4}$ inches. The width, therefore, is an almost absolute test; any leaf, measuring $1\frac{3}{4}$ and upwards is certain to be *Corypha umbr.*, while any leaf measuring $1\frac{1}{4}$ or below, is almost certain to be *Borassus fl.* With the width of about $1\frac{1}{2}$ inches, there may occasionally be a doubt, but this will be removed by the application of the two additional tests of thickness and venation. In any case where the actual leaf can be examined, the three tests in combination are absolutely decisive. In almost all cases where the leaf itself can not be examined, its width, if recorded, will be found decisive. Thus in the case of Add. 1706 of the Cambridge MSS., probably of A. D. 1261 (Bendall, p. 199 and Table III, No. 57), the width of which is stated to be $1\frac{1}{2}$ inches, I judged it to be a *Corypha* manuscript; and this was kindly verified for me by Professor Cowell by means of *Corypha* and *Borassus* specimens which I transmitted to him.

I have been speaking hitherto of the leaf in its prepared state as writing material. With regard to the natural leaf, which I had an opportunity of examining and measuring, with the kind assistance of Dr. Prain, in the Sibpur Botanic Gardens, the case stands as follows:—Both the *Corypha* and the *Borassus* palms, as is well-known, have plicate leaves folding like a fan, consisting of a number of segments. Through the middle of each segment, from end to end, runs a hard rib. The flaps on both sides of the rib are tough and flexible; and these yield the material which is prepared for writing purposes. They taper off from their widest point towards both ends; accordingly suitable strips are cut out from the middle, of such various lengths as the size of the natural half-segment will admit. These strips are prepared for writing, by boiling in water or milk; and finally, when wanted for writing a book, the required number of strips are cut down to a uniform size. Uniformity, however, was always more carefully attended to in point of length than in point of breadth. In manuscripts, of an older date especially, leaves of a much smaller breadth are occasionally mixed with others (forming the majority) which are much wider. Thus in No. 35 of Table I and Nos. 1, 4, 9, 10, 11 of Table II the occurrence of narrower leaves is indicated in brackets: they are occasionally found as narrow as $1\frac{1}{3}$ inches.

The half-segment (that is a segment divided longitudinally along the central rib) of a *Borassus* leaf, at the point of its greatest width, may measure 2 inches, but it usually measures less. It tapers off very rapidly towards both ends; hence it is not possible to cut out from it a piece of practically uniform width of more than $1\frac{1}{2}$ inches. A strip of about $16 \times 1\frac{1}{2}$ inches is the largest that can be obtained. If a greater length is desired, consistent with uniform width, the latter will be smaller. From the usual size of the natural segment, however, only prepared strips of a smaller width than $1\frac{1}{2}$ inches can be obtained. Occasionally the point of uniform width is neglected, and thus leaves are obtained measuring in length up to 20 inches, with a maximum width of $1\frac{1}{2}$ inches. Examples are Nos. 77 and 87 in Table I, the width of which grows (as noted in the Table) from 1 or $1\frac{1}{4}$ inches at the ends to $1\frac{1}{2}$ inches in the middle of the leaf. As a rule, however, a prepared leaf, measuring a length of more than 16 inches, with a width of $1\frac{1}{2}$ inches, is more likely to be a *Corypha* leaf.

The half-segment of a *Corypha* leaf, at its widest point, may measure three inches. I measured one leaf of this great size in the Sibpur Royal Botanic Gardens; but it is not improbable that leaves of this size may occur more commonly in Ceylon and Malabar, where the tree grows wild. A *Corypha* segment is much longer than a *Borassus* segment, and it tapers off far more gently, than the latter, from its widest point to its ends. Hence it is possible to cut much longer and wider strips from a *Corypha* segment. The largest manuscripts that I have measured are Nos. 30 and 34 in Table I, which measure $32\frac{2}{3} \times 2\frac{1}{2}$ and $33 \times 2\frac{1}{4}$ inches respectively. The length, however, may extend to 3 feet and more, and the width to 3 inches. The largest manuscript of which I know is No. 2068 in the Notices of Sanskrit MSS. It is said to measure 40×2 inches (see Table III, No. 138, and footnote 11). The next largest are Nos. 262 and 289 (in Professor Peterson's Report for 1884-86, pp. 109 and 142; see also Table III, No. 72). They are said to measure $37\frac{1}{2} \times 2\frac{1}{2}$ and $37 \times 2\frac{3}{4}$ inches respectively. From the particular half segment which I measured to be 3 inches wide³ strips measuring about $2\frac{1}{2} \times 22$, or $2\frac{1}{4} \times 25$, or 2×30 inches might have been cut. On the other hand, I have also measured narrow specimens of natural *Corypha* segments which would only yield strips measuring $16 \times 1\frac{1}{2}$ inches or even less. Examples of manuscripts of this kind are Nos. 48, 57, 67 in Table I and Nos. 4, 5, 8, 12 in Table II. Of course when strips of the great width of 3 inches were desired, one would usually

³ The complete natural segment, of course, measured 6 inches across. Similarly the widest complete *Borassus* segment measures 4 inches across the widest point.

have had to be contented with but a short length. The only two manuscripts of this great width that I know are No. 187 in Professor Peterson's Third Report for 1884-86 (p. 8), and No. 58 in his Fifth Report for 1892-95 (p. 98, also Table III, No. 83), both of which are 3 inches broad. The former of these is only $14\frac{1}{2}$ inches long. The latter (dated 1369 A.D.) is said to be 32 inches long, but I suspect that this is an error: its measures probably are 12×3 or 32×2 .⁴ Corypha manuscripts of very great length, however, rarely possess an uniform width. Their leaves are cut from a whole half-segment; their maximum width is in the middle and it decreases towards both ends. A good example is No. 30 in Table I, some of the leaves of which slope from $2\frac{1}{2}$ to $1\frac{1}{2}$ inches. On the other hand, good examples of great length combined with practically uniform width are Nos. 34 and 36 in Table I, the breadth of which varies by no more than $\frac{1}{4}$ inch or even less. Sometimes the half-segments of Corypha leaves were cut, across their breadth, into halves, and the strips for writing were cut from these halves. In this case, of course, the maximum width is at one end of the inscribed leaf, and gradually decreases to the other end. Examples of this kind are Nos. 2, 28, 32 in Table I, the leaves of which decrease from 2 to $1\frac{3}{4}$, $1\frac{3}{4}$ to $1\frac{1}{4}$ and $2\frac{1}{4}$ to $1\frac{3}{4}$ inches respectively.

I may add that there is a kind of Corypha palm, the *Corypha elata*, which grows, probably *cultivated*, in Bengal and Bihâr. But its leaves are not suitable for the purpose of writing books, and have never been so used. Its complete natural segments are much too narrow; they measure only about $1\frac{1}{2}$ inches, and allow only strips of $\frac{3}{4}$ inch or less to be cut from them.

Having premised this much, I may now proceed to state that I have examined the actual or facsimile leaf of 130 manuscripts. They are

⁴ Another clear instance of an error is in the record of No. 86 (Fifth Report, p. 136). This MS., dated 1241 A.D., is said to be of palm-leaf and to measure 16×4 inches. This width of 4 inches, for a palm-leaf MS., is an impossibility; it would indicate a natural segment of the width of at least 8 inches!! Prof. Bhandarkar, whom I consulted, writes to me: "There must be some mistake about the breadth of the leaves of No. 86. I have seen the MSS. in the Deccan College and a good many at Pâtân, perhaps the same as those catalogued by Dr. Peterson, but I do not remember having seen any leaves of that breadth. Dr. Peterson's cataloguing work was done by clerks and agents, and it is not unlikely that it was not done with the scrupulous care of the scientific scholar." The measures would suit a paper MS.; and that possibly is the solution of the error. There is a similar error in Bendall's Catalogue of the Cambridge MSS. Here Add. 1633 is described as a palm-leaf MS. of the extraordinary breadth of 5 inches. It is, however, a Paper MS., as I am informed by Professor Cowell, who, at my request, very kindly inspected the manuscript.

shown in the subjoined Tables I and II, with 87 and 43 Nos. respectively. Table I contains manuscripts, of which the date is known, while Table II contains manuscripts of conjectural dates. The lists are not selected ones in any other sense than that I have included in it none but such manuscripts as I have actually seen and examined myself, and thus determined the palm to which their leaves belong. Those manuscripts (27 out of 130) of which I have seen leaves only in photographic facsimile are marked with an asterisk. The manuscripts marked "Kielhorn" and "Bhandarkar" are preserved in the Deccan College in Poona. The opportunity of inspecting them I owe to the kindness of Mr. Giles, Director of Public Instruction in Bombay, and Professor Abaji Kathavate of the Deccan College, who transmitted specimen leaves to me. The numbers refer to the Reports on the Search of Sanskrit MSS. in the Bombay Presidency for 1880-81 and 1887-91. The Tanjore manuscripts, which are referred to by their numbers in Burnell's Classified Catalogue, were transmitted to me by Mr. Geo. T. Oliver, the Receiver and Manager of the Tanjore Palace Estate; so were those, marked "in private hands," by Maulvi Muhammad Abdullah, an officer of the Darbhanga Rāj. To both these gentlemen I wish here to express my sincere thanks. Nearly the whole of the remainder of the list are manuscripts preserved in Calcutta in the collections of the Asiatic Society of Bengal and the Government of India. They are referred to as "Mitra," "Ind. Govt." and "Notices." These, of course, I had no difficulty in inspecting. My friends, Mahāmahōpadhyāya Pandit Hara Prasad Shastri, and Muni Hans Vijay-ji, the head of one of the Jain Çākhās, were also kind enough to let me see a few palm-leaf manuscripts in their possession. I may add that the measurements of all the manuscripts in the two lists have been made or verified by myself.

TABLE I.⁵

No.	A. D.	Date.	Reference.	Loc.	Mat.	Measure.
1	[450]		Fragments, J. A. S. B.	W. Ind.	Cor.	? × 2
2*	[520]		Horiuzi.	W. Ind.	Cor.	11 × 2 to 1½
3*	[550]		Add. 1702, Bendall.	W. Ind.	Cor.	12 × 2
4*	859	Harṣa 252.	Add. 1049, Bendall.	W. Ind.	Cor.	16 × 2
5*	1008	Nep. 128.	Add. 866, Bendall.	Nep.	Cor.	21 × 2
6	1014	Nep. 134.	No. 3828, Ind. Govt.	Nep.	Cor.	12¾ × 2½
7*	1015	Nep. 135.	Pal. Soc., No. XXI.	Nep.	Cor.	21½ × 2½
	1020	5 Mahipāla.	Add. 1464, Bendall.	Bih.	Cor.	21 × 2½
	1026	Nep. 146.	See No. 6 above.		Cor.	
9	1071	Nep. 191.	A 15, Mitra.	Nep.	Cor.	22¾ × 2¼
10	1078	Nep. 198.	No. 3830, Ind. Govt.	Nep.	Cor.	18 × 1¾
11*	1084	Nep. 204.	Pal. Soc., No. XVII.	Nep.	Cor.	12 × 2
12	1089	Sam. 1145.	No. 35, Kielhorn.	W. Ind.	Cor.	25½ × 2¼
13	1090	Sam. 1146.	No. 36, do.	W. Ind.	Cor.	25½ × 2¼

⁵ About No. 6 see *Journal, As. Soc. Beng.*, Vol. LXII (1893), p. 252. The MS. has two dates; viz., N. S. 134 on the outside of the first written leaf, and N. S. 146 in the colophon, on the last leaf. These are probably the dates of beginning and finishing the copy. There are similarly two dates on No. 50; viz., Lakṣ. 374 and Çak 1423. As to No. 72 I may note that under No. 2126 of the "Notices" two manuscripts are described. The Government manuscript is a Corypha MS., and is entered here in Table I. The other manuscript, which I have not seen, is entered in Table III, No. 128; and to judge from its measurements, it is a Borassus MS. The date of the Government manuscript, however, is *çakābdāḥ* | 16 | with a lacuna for the units and tens, which may mean 1600 as Dr. Mitra assumed; but it may be also a later date. The measurements of Nos. 26 and 41 have been kindly verified for me by the Honorary Librarian of the Royal Asiatic Society. Some leaves of Nos 39 and 42 are much narrower, viz., $32 \times 1\frac{1}{2}$ (1) and $15 \times 1\frac{3}{4}$ ($1\frac{1}{4}$) respectively. The equation of the dates of the Lakṣmaṇiya Era has been made with 1105, the present year 1898 being = 793 L. E., and the 1st year of that era running from the 15 Jan., 1106, to the 15th January, 1107. No. 65 is dated Çaka 1555 and San 1041. The latter date refers to the Faṣli Era of Bengal, and is = 1633 A.D.; see Cunningham's *Book of Indian Eras*, p. 82. "Pal. Soc." refers to the Publications of the London Palaeographical Society. In the case of a few manuscripts, such as No. 17, 55, etc., the length is not given by me, because at the time I examined them, I forgot to take a note of it.

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
14 ⁶	1116	Sam. 1172.	Muni Hans Vijay-ji.	W. Ind.	Cor.	29 × 2 $\frac{1}{2}$
15	1120	Sam. 1176.	No. 53, Kielhorn.	W. Ind.	Cor.	13 × 1 $\frac{5}{8}$
16	1120	15 Rāma- pāla.	In my possession.	Bih.	Cor.	22 × 2 $\frac{1}{4}$
17	1130	Nep. 250.	With H. P. Shāstri.	Nep.	Cor.	2
18*	1132	Sam. 1189.	With Prof. Bühler.	N. Ind.	Cor.	2
19	113[8]	Sam. 119*.	No. 58, Kielhorn.	W. Ind.	Cor.	28 × 2 $\frac{1}{2}$
20*	1165	Nep. 285.	Add. 1693, Bendall.	Nep.	Cor.	16 × 2 $\frac{1}{2}$
21*	1165	4 Gōvinda- pāla.	No. 1, R. As. Soc.	Bih.	Cor.	22 $\frac{1}{2}$ × 2 $\frac{1}{2}$
22*	1166	Nep. 286.	No. 2, R. As. Soc.	Nep.	Cor.	22 $\frac{1}{2}$ × 2
23*	1167	Nep. 287.	Add. 1686, Bendall.	Nep.	Cor.	11 × 2
24*	1179	Nep. 299.	Add. 1691, Bendall.	Nep.	Cor.	12 × 2
25	1185	24 Govinda- pāla.	No. 3822, Ind. Govt.	Bih.	Cor.	11 $\frac{3}{4}$ × 2
26*	1198	Nep. 318.	No. 69, R. As. Soc.	Nep.	Cor.	12 $\frac{1}{2}$ × 2
27*	1199	38 Gōvinda- pāla.	Add. 1699, Bendall.	Bih.	Cor.	11 $\frac{1}{2}$ × 2 $\frac{3}{8}$
28	1208	Sam. 1264.	No. 8, Kielhorn.	W. Ind.	Cor.	13 $\frac{1}{2}$ × 1 $\frac{3}{4}$ to 1 $\frac{1}{4}$
29*	1229	Çak. 1151.	Pal. Soc., No. I.		Cor.	17 $\frac{2}{3}$ × 2 $\frac{1}{4}$
30	1238	Sam. 1294.	No. 38, Kielhorn.	W. Ind.	Cor.	32 $\frac{5}{8}$ × 2 $\frac{1}{2}$ to 1 $\frac{1}{2}$
31	1276	Sam. 1332.	No. 3, do.	W. Ind.	Cor.	14 $\frac{1}{2}$ × 2 $\frac{1}{8}$
32	1284	Sam. 1340.	No. 60, do.	W. Ind.	Cor.	15 × 2 $\frac{1}{4}$ to 1 $\frac{3}{4}$
33*	1286	Nep. 406.	Pal. Soc., No. XXXII.	Nep.	Cor.	13 × 2 $\frac{1}{4}$
34*	1291	Sam. 1348.	Pal. Soc., No. LVIII.		Cor.	33 × 2 $\frac{1}{4}$
35	1297	Kal. 4398.	No. 34, Kielhorn.	W. Ind.	Cor.	14 $\frac{3}{4}$ × 1 $\frac{5}{4}$ (1 $\frac{1}{4}$)
36	1303	Sam. 1359.	No. 37, do.	W. Ind.	Cor.	30 $\frac{1}{2}$ × 2 $\frac{1}{4}$

⁶ This is a manuscript written by Açōka Candra and Dhanēçvara Sādhu, and corrected by Vardhamāna Sūri (apparently the author), Nēmicandra Munīçvara, and Pārçvacandra Upādhyāya. The name of the work is Dharma Karaṇḍaka Sūtra Tīkā, and its author is Vardhamāna Sūri, a pupil of Abhayadēva Sūri. Its date is given in the following çloka: *vikramatō varṣāṇām çatēṣv = ēkādacaśv = atitēṣu | dvā-saptatyā varṣair = adhikēṣu kṛtā vikṛtir = ēṣā ||*

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
37	1319	Lakṣ. 214.	In private hands.	Bih.	Cor.	$15\frac{3}{4} \times 1\frac{3}{8}$
38	1331	Nep. 451.	No. 3824, Ind. Govt.	Nep.	Cor.	12×2
39	1340	Sam. 1396.	Muni Hans Vijay-ji.	W. Ind.	Cor.	$32 \times 2\frac{3}{16}(1\frac{1}{2})$
40	1356	Nep. 476.	No. 3823, Ind. Govt.	Nep.	Cor.	$11\frac{1}{4} \times 2$
41*	1364	Nep. 484.	No. 74, R. As. Soc.	Nep.	Cor.	$12\frac{1}{2} \times 1\frac{1}{4}$
42	1368	Sam. 1424.	Muni Hans Vijay-ji.	W. Ind.	Cor.	$15 \times 2\frac{3}{4}(2)$
43*	1372	Nep. 492.	Pal. Soc., No. LVII.	Nep.	Cor.	$20\frac{1}{2} \times 2\frac{3}{8}$
44*	1385	Nep. 505.	Add. 1395, Bendall.	Nep.	Cor.	$13\frac{1}{2} \times 2$
45	1386	Sam. 1442.	No. 1980, Notices.	Beng.	Cor.	11×2
46	1395	Nep. 515.	Ind. Govt.	Nep.	Cor.	$13\frac{1}{4} \times 1\frac{3}{8}$
47*	1446	Sam. 1503.	Pal. Soc., No. XXXIII.	Bih.	Cor.	$13\frac{1}{2} \times 2\frac{1}{4}$
48	1450	Lakṣ. 345.	In private hands.	Bih.	Cor.	$13 \times 1\frac{1}{2}$
49	1467	Lakṣ. 362.	No. 3821, Ind. Govt.	Bih.	Cor.	13×2
50	1479	Lakṣ. 374.	No. 4026, Ind. Govt.	Bih.	Cor.	$11\frac{1}{2} \times 2$
	1507	Çak. 1423.	See No. 50 above, and footnote 5.			
51	1504	Lakṣ. 399.	No. 1979, Notices.	Bih.	Cor.	$14\frac{1}{2} \times 2\frac{1}{4}$
52	1513	Lakṣ. 408.	In private hands.	Bih.	Cor.	$13\frac{3}{4} \times 1\frac{1}{2}$
53	1514	Çak. 1436.	No. 1273 Notices.	Beng.	Cor.	$14\frac{1}{4} \times 1\frac{3}{4}$
54	1531	Çak. 1453.	No. 1165 do.	Beng.	Cor.	$13\frac{1}{2} \times 2$
55	1553	Çak. 1475.	H. Prasāda Shāstri.	Beng.	Cor.	$1\frac{1}{4}$
56*	1557	Lakṣ. 452.	Pal. Soc., No. LXXXII.	Bih.	Cor.	$13\frac{5}{8} \times 2$
57	1572	Çak. 1494.	No. 1274, Notices.	Beng.	Cor.	$13\frac{3}{4} \times 1\frac{1}{2}$
58	1575	Lakṣ. 470.	In private hands.	Bih.	Cor.	$13\frac{1}{2} \times 2\frac{1}{4}$
59*	1583		Add. 1556, Bendall.		Cor.	$2\frac{1}{2}$
60	1587	Çak. 1509.	No. 1976, Notices.	Beng.	{ Cor. } { Bor. }	$12 \times \left\{ \begin{array}{l} 1\frac{1}{8} \\ 1\frac{1}{2} \end{array} \right\}$
61	1594	Çak. 1516.	No. 1975 do.	Beng.	Bor.	$12 \times 1\frac{1}{2}$
62	1608	Lakṣ. 503.	In private hands.	Bih.	Cor.	$13\frac{1}{2} \times 1\frac{1}{8}$
63	1609	Lakṣ. 504.	do.	Bih.	Cor.	$13\frac{3}{4} \times 2$

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
64	1616	Lakṣ. 511.	In private hands.	Bih.	Cor.	$14\frac{1}{2} \times 1\frac{3}{8}$
65	1633	Çak. 1555.	do.	Bih.	Cor.	$12 \times 1\frac{7}{8}$
66	1647	Çak. 1569.	do.	Bih.	Cor.	$11\frac{1}{4} \times 2$
67	1661	Lakṣ. 556.	do.	Bih.	Cor.	$12\frac{3}{4} \times 1\frac{1}{2}$
68	1668	Çak. 1590.	do.	Bih.	Cor.	$7\frac{1}{2} \times 1\frac{3}{4}$
69	1669	Çak. 1591	do.	Bih.	Cor.	$7 \times 1\frac{3}{8}$
	1660	Lakṣ. 555				
70	1675	Çak. 1597.	H. Prasāda Shāstri.	Beng.	Bor.	$1\frac{3}{8}$
71	1677	Çak. 1599.	do. do.	Beng.	Bor.	$1\frac{1}{2}$
72	1678	Çak. 1600.	No. 2126, Notices.	Beng.	Cor.	$15\frac{1}{4} \times 2$
73	1680	Çak. 1602.	In private hands.	Bih.	Cor.	$14 \times 1\frac{3}{8}$
74	1683	$\frac{2}{2}$ Mukunda.	Ind. Govt.	Oris.	Bor.	$? \times 1\frac{1}{4}$
75	1683	$\frac{2}{2}$ Mukunda.	do.	Oris.	Bor.	$15 \times 1\frac{1}{8}$
76	1687	Çak. 1609.	No. 1551, Notices.	Beng.	Bor.	$11 \times 1\frac{3}{8}$
77	1688	Çak. 1610.	No. 1550 do.	Beng.	Bor.	$20 \times 1\frac{1}{2}$ to 1
78	1689	Çak. 1611.	No. 1580 do.	Beng.	Bor.	$14\frac{1}{2} \times 1\frac{1}{2}$
79	1690	$\frac{4}{3}$ Mukunda.	No. 2837, do.	Oris.	Bor.	$16 \times 1\frac{1}{4}$
80	1694	Çak. 1616.	No. 10040, Tanjore.	S. Ind.	Bor.	$10\frac{7}{8} \times 1\frac{1}{8}$
81	1708	17 Divya-Sirīha.	Ind. Govt.	Oris.	Bor.	$15\frac{1}{2} \times 1\frac{1}{2}$
82	1721	Çak. 1643.	H. Prasāda Shāstri.	Beng.	Cor.	$2\frac{1}{4}$
83*	1724		Burnell, S. Ind. Pal.	S. Ind.	Cor.	$15\frac{1}{4} \times 2\frac{3}{8}$
84	1739	Çak. 1661.	No. 1845, Notices.	Bih.	Cor.	$15\frac{1}{2} \times 2$
85	1752	10 Kēçari-Dēva.	Ind. Govt.	Oris.	Bor.	$14\frac{3}{4} \times 1\frac{3}{8}$
86	1766	24 do.	do.	Oris.	Bor.	$15 \times 1\frac{1}{8}$
87	1815	Çak. 1737.	No. 1607, Notices.	Beng.	Bor.	$14\frac{1}{2} \times 1\frac{1}{2}$ to 1

All manuscripts in the foregoing Table (with the exception of Nos. 1-3) bear an actual date. The following Table II includes manuscripts the approximate date of which can be fixed with some degree of certainty. This has been done by myself, mainly on palæographic grounds, in all cases except those marked with the letter B. The date

of the latter is that given to them by Dr. Burnell in his Classified Catalogue of Tanjore Manuscripts.

TABLE II.

No.	A. D.	Reference.	Loc.	Mat.	Measure.
1	1150	No. 44, Kielhorn.	W. Ind.	Cor.	$14\frac{1}{2} \times 1\frac{7}{8}$ ($1\frac{3}{8}$)
2	1150	No. 46 do.	W. Ind.	Cor.	$29\frac{1}{4} \times 1\frac{3}{4}$
3	1200	No. 33 do.	W. Ind.	Cor.	$15 \times 1\frac{3}{4}$
4	1200	No. 68 do.	W. Ind.	Cor.	$12\frac{1}{2} \times 1\frac{1}{2}$ ($1\frac{1}{4}$)
5	1225	No. 40 do.	W. Ind.	Cor.	$11 \times 1\frac{1}{4}$
6	1250	No. 32 do.	W. Ind.	Cor.	$12\frac{1}{2} \times 1\frac{1}{8}$
7	1250	No. 69 do.	W. Ind.	Cor.	$14\frac{1}{2} \times 2$
8	1300	No. 30 do.	W. Ind.	Cor.	$12\frac{3}{4} \times 1\frac{1}{2}$
9	1300	No. 63 do.	W. Ind.	Cor.	$14\frac{1}{2} \times 1\frac{3}{4}$ ($1\frac{1}{2}$)
10	1325	No. 20 do.	W. Ind.	Cor.	$12\frac{3}{4} \times 1\frac{3}{4}$ ($1\frac{1}{4}$)
11	1375	No. 67 do.	W. Ind.	Cor.	14×2 ($1\frac{1}{4}$)
12	1525	No. 1062 Bhandarkar.	S. Ind.	Cor.	$14 \times 1\frac{3}{8}$
13*	1550	Pal. Soc., No. LXX.	S. Ind.	Bor.	$14 \times 1\frac{1}{4}$ (B)
14 ⁷	1550	No. 1056, Bhandarkar.	S. Ind.	Cor.	19×2
15*	1550	No. 11894, Tanjore.	S. Ind.	Bor.	$18\frac{1}{2} \times 1\frac{3}{8}$ (B)
16	1580	No. 10093 do.	S. Ind.	Bor.	$16 \times 1\frac{5}{16}$ (B)
17	1600	No. 1061, Bhandarkar.	S. Ind.	Cor.	$17\frac{1}{2} \times 2$
18	1600	No. 9075, Tanjore.	S. Ind.	Bor.	$17 \times 1\frac{5}{16}$ (B)
19	1600	No. 10511 do.	S. Ind.	Bor.	$11\frac{1}{2} \times 1\frac{5}{16}$ (B)
20	1600	No. 9997 do.	S. Ind.	Bor.	$18\frac{1}{4} \times 1\frac{9}{16}$ (B)
21	1620	No. 9140 do.	S. Ind.	Bor.	18×1 (B)
22	1620	No. 10288 do.	S. Ind.	Bor.	$18\frac{3}{8} \times 1\frac{1}{2}$ (B)
23	1625	No. 10869 do.	S. Ind.	Bor.	15×1 (B)

7. The inner leaves of this manuscript are old. The outer ones, at the beginning and end, are larger ($20\frac{1}{2} \times 2\frac{1}{2}$) and of a much more modern date (about 1700 A.D.). I examined the leaves numbered 1,105 and 260.

No.	A.D.	Reference.	Loc.	Mat.	Measure.
24	1650	No. 1060, Bhandarkar.	S. Ind.	Cor.	$19\frac{1}{2} \times 2\frac{1}{8}$
25	1650	No. 9710, Tanjore.	S. Ind.	Cor.	$13\frac{7}{8} \times 2$
26	1650	No. 9908 do.	S. Ind.	Cor.	$18\frac{7}{8} \times 2\frac{1}{8}$
27	1650	No. 9066 do.	S. Ind.	Bor.	$16 \times 1\frac{3}{8}$ (B)
28	1650	No. 9185 do.	S. Ind.	Bor.	$15 \times 1\frac{1}{2}$ (B)
29	1650	No. 9760 do.	S. Ind.	Bor.	$15\frac{1}{2} \times 1\frac{1}{16}$ (B)
30	1650	No. 9076 do.	S. Ind.	Bor.	$15\frac{3}{4} \times 1\frac{3}{8}$ (B)
31*	1670	No. 9531 do.	S. Ind.	Bor.	$19\frac{7}{8} \times 1\frac{9}{16}$ (B)
32	1700	No. 989, Bhandarkar.	S. Ind.	Bor.	$13\frac{1}{2} \times 1\frac{1}{2}$
33	1700	No. 9169, Tanjore.	S. Ind.	Cor.	$16 \times 2\frac{1}{2}$ (B)
34	1700	No. 9605 do	S. Ind.	Cor.	$12 \times 1\frac{1}{16}$
35	1700	No. 9870 do.	S. Ind.	Cor.	14×2
36	1700	No. 9960 do.	S. Ind.	Bor.	$15\frac{3}{8} \times 1\frac{5}{16}$ (B)
37	1700	No. 9935 do.	S. Ind.	Bor.	$16\frac{3}{8} \times 1\frac{5}{8}$ (B)
38	1700	No. 10910 do.	S. Ind.	Bor.	$14\frac{3}{4} \times 1\frac{3}{16}$ (B)
39	1720	No. 8974 do.	S. Ind.	Bor.	$18\frac{1}{2} \times 1$ (B)
40	1720	No. 10868 do.	S. Ind.	Bor.	$17\frac{1}{8} \times 1\frac{5}{8}$ to $1\frac{1}{16}$ (B)
41	1750	No. 9098 do.	S. Ind.	Bor.	$14\frac{3}{8} \times 1\frac{3}{16}$ (B)
42	1750	No. 9739 do.	S. Ind.	Bor.	$12\frac{3}{4} \times 1\frac{9}{16}$ (B)
43	1750	No. 10786 do.	S. Ind.	Bor.	$16\frac{3}{8} \times 1\frac{3}{8}$ (B)

In the following remarks my arguments will be based entirely on the information furnished by Table I. The information of Table II will be used only as subsidiary and corroborative evidence.

Further, for the present, my remarks will be limited entirely to the conditions obtaining in Northern India, *i.e.*, broadly speaking North of the 20th degree of latitude. The case of Southern India will be considered later on.

The first point, very clearly brought out by Table I, is the exclusive use of *Corypha* leaves throughout Northern India, up to the latter part of the 17th century A.D. A very marked change begins with 1675 A.D. Before that date (with one exception, No. 60, which I shall

presently refer to) all dated manuscripts are uniformly written on Corypha leaves. From 1675 A.D. the use of the Borassus leaf almost entirely supersedes that of the Corypha leaf. Commencing with that year there are 18 manuscripts examined by me. Two of these are South-Indian which must be excluded. Of the remaining 16 manuscripts 12 are written on Borassus leaves, and only 4 on Corypha leaves; that is to say, 75 per cent. are Borassus manuscripts.

In order to appreciate the very effective character of the evidence of Table I, let it be noted that, between the years 1000 and 1770, there is a total of 77 decades, of which not less than 51 are represented in the Table by one or more manuscripts. The 14th and 17th centuries are the best represented, every decade appearing in the Table, except those beginning with 1320, 1620 and 1650. The 15th century is the worst represented, as the decades beginning with 1400, 1410, 1420, 1430, 1480 and 1490 are wanting. The effectiveness of the representation is corroborated by Table II, which, it may well be assumed, would have filled up many gaps in the 12th, 13th and 14th centuries, if the exact dates of the manuscripts listed in it were known. The effectiveness will be found still more corroborated by the exact dates given in Table III. With Tables I and III combined, there remain only 9 decades unrepresented; *viz.*, those beginning with 1040, 1100, 1140, 1150, 1430, 1480, 1650, 1710, and 1740, and some of these probably are covered by Table II.

There are only two manuscripts dating before 1675 A.D., which are written on Borassus leaves. These are Nos. 60 and 61, belonging to 1587 and 1594 A.D. respectively. No. 61 is written wholly on Borassus leaves; while No. 60 is only so partially: the body of it is written on Corypha leaves, while the end is on a Borassus leaf. These are exceptional cases: they only indicate, as I shall show further on, that the use of Borassus leaves first began in a sporadic form in Southern Bengal. But for Northern India generally, Table I shows that we may take the year 1675 A.D. as the epoch that marks the change from the use of Corypha to that of Borassus.

Before proceeding further, it may be as well at once to meet an objection that might suggest itself. It appears to be believed that Borassus leaves are much less durable than Corypha leaves. This may or may not be true: I have no special evidence on the subject. But Dr. Burnell in his *South-Indian Palaeography* (2nd ed.), p. 41, says: "It is hopeless to look for old specimens, as palm-leaf MSS. perish rapidly in the Tamil country, where they are mostly written on leaves of the '*Borassus flabelliformis*,' far inferior to the Talipat leaves in beauty and durability." So also Mr. Simon de Silva, Mudaliyar, in Colombo informs me that "the Talipat leaf is preferred for the purpose

of book writing on account of its durability and polish." These observations may be true with regard to Southern India and Ceylon; they would probably also apply to Bengal and Orissa with their equally damp climate; but would hardly apply to the rest of Northern India with its far drier climate. But be that as it may, I have drawn up Table III for the purpose of showing how little probability there is that all Borassus MSS., dating before 1675 A.D., may have perished on account of their inferior durability, or that, by some unaccountable and improbable chance, none of them may have fallen into my hands when making up Table I.

TABLE III.

No.	A. D.	Date.	Reference.	Loc.	Mat.	Measure.
1	1039	Nep. 159.	Add. 1683, Bendall.	Nep.	Cor.	21 × 2
2	1054	14 Nayapāla.	Add. 1688 do.	Bih.	Cor.	22 × 2
3	1065	Nep. 185.	Add 1684 do.	Nep.	Cor.	21 × 2
4	1068	Nep. 188.	Add. 1680 do.	Nep.	Cor.	11 × 2
5	1098	Sam. 1154.	Peterson ⁵ , No. 13.	W. Ind.	(Cor.)	73 × 1 $\frac{1}{4}$
6	1123	Sam. 1179.	Kielhorn, No. 42.	W. Ind.	Cor.	13 × 2 $\frac{1}{4}$
7	1125	Sam. 1181.	Peterson ³ , No. 229.	W. Ind.	Cor.	13 $\frac{1}{2}$ × 1 $\frac{1}{2}$
8	1125	Sam. 1181.	Peterson ⁵ , No. 66.	W. Ind.	(Cor.)	12 × 1 $\frac{1}{4}$
9	1130	Sam. 1186.	do. No. 40.	W. Ind.	Cor.	10 × 1 $\frac{1}{2}$
10	1130	Sam. 1186.	do. No. 63.	W. Ind.	(Cor.)	13 × 1
11	1131	Sam. 1187.	do. No. 36.	W. Ind.	Cor.	27 × 2 $\frac{1}{2}$
12	1162	Sam. 1218.	do. No. 31.	W. Ind.	Cor.	14 × 2
13	1162	Sam. 1218.	Kielhorn, No. 13.	W. Ind.	Cor.	29 × 2 $\frac{1}{2}$
14	1165	Nep. 285.	Add. 1693, Bendall.	Nep.	Cor.	17 × 2 $\frac{1}{2}$
15	1165	Sam. 1221.	Peterson ³ , No. 240.	W. Ind.	Cor.	27 × 2 $\frac{1}{2}$
16	1173	Sam. 1229.	do. No. 215.	W. Ind.	Cor.	14 $\frac{1}{2}$ × 1 $\frac{3}{4}$
17	1175	Sam. 1231.	Peterson ⁵ , No. 1.	W. Ind.	Cor.	12 × 1 $\frac{3}{4}$
18	1191	Sam. 1247.	Peterson ³ , No. 225.	W. Ind.	Cor.	13 $\frac{1}{2}$ × 1 $\frac{3}{4}$
19	1193	Sam. 1249.	do. No. 309.	W. Ind.	Cor.	29 × 2 $\frac{1}{2}$

No.	A. D.	Date.	Reference.	Loc.	Mat.	Measure.
20	1199	Nep. 319.	Add. 1657, (2), Bendall.	Nep.	Cor.	12 × 2
21	1202	Sam. 1258.	Peterson ⁵ , No. 65.	W. Ind.	Cor.	12 × 1½
22	1204	Sam. 1260.	Peterson ⁵ , No. 189.	W. Ind.	Cor.	15½ × 1¾
23	1205	Sam. 1261.	do. No. 220.	W. Ind.	Cor.	33½ × 2½
24	1205	Nep. 325.	Add. 1644, Bendall.	Nep.	Cor.	21 × 2
25	1207	Sam. 1263.	Peterson ⁵ , No. 198.	W. Ind.	Cor.	10½ × 1½
26	1215	Sam. 1271.	Peterson ⁵ , No. 80.	W. Ind.	Cor.	16½ × 1½
27	1228	Sam. 1284.	do. No. 78.	W. Ind.	Cor.	11 × 2½
28	1228	Sam. 1284.	Peterson ⁵ , No. 226.	W. Ind.	Cor.	14 × 2½
29	1230	Sam. 1286.	do. No. 288.	W. Ind.	Cor.	34½ × 2¾
30	1231	Sam. 1287.	do. No. 266.	W. Ind.	Cor.	15¾ × 1½
31	1232	Sam. 1288.	Peterson ⁵ , No. 55.	W. Ind.	Cor.	15 × 2
32	1235	Sam. 1291.	Peterson ⁵ , No. 320.	W. Ind.	Cor.	36 × 2½
33	1236	Sam. 1292.	do. No. 217.	W. Ind.	Cor.	33½ × 2½
34	1236	Sam. 1292.	do. No. 300.	W. Ind.	Cor.	36 × 2½
35	1236	Sam. 1292.	do. No. 277.	W. Ind.	Cor.	15½ × 2
36	1237	Sam. 1293.	do. No. 267.	W. Ind.	Cor.	14½ × 1¾
37	1237	Sam. 1293.	Peterson ⁵ , No. 46.	W. Ind.	Cor.	12 × 1½
38	1238	Sam. 1294.	do. No. 34.	W. Ind.	Cor.	29 × 2½
39	1238	Sam. 1294.	Peterson ⁵ , No. 186.	W. Ind.	Cor.	14½ × 2
40	1238	Sam. 1294.	do. No. 275.	W. Ind.	Cor.	29½ × 2¾
41	1240	Sam. 1296.	do. No. 202.	W. Ind.	Cor.	12½ × 1½
42	1240	Sam. 1296.	do. No. 250.	W. Ind.	Cor.	34½ × 2
43	1240	Sam. 1296.	Peterson ⁵ , No. 26.	W. Ind.	Cor.	32 × 2½
44	1242	Sam. 1298.	Peterson ⁵ , No. 319.	W. Ind.	Cor.	34½ × 2½
45	1243	Sam. 1299.	do. No. 276.	W. Ind.	Cor.	34 × 2½
46	1244	Sam. 1300.	Kielhorn, No. 47.	W. Ind.	Cor.	18½ × 2
47	1245	Sam. 1301.	Peterson ⁵ , No. 219.	W. Ind.	Cor.	33½ × 2½

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
48	1245	Sam. 1301.	Peterson ³ , No. 337.	W. Ind.	Cor.	$32\frac{1}{2} \times 2$
49	1245	Sam. 1301.	do. No. 247.	W. Ind.	Cor.	$34\frac{1}{2} \times 2\frac{1}{2}$
50	1247	Sam. 1303.	do. No. 286.	W. Ind.	Cor.	$15\frac{1}{2} \times 2$
51	1248	Sam. 1304.	Kielhorn, No. 28.	W. Ind.	Cor.	15×2
52	1251	Sam. 1307.	Peterson ³ , No. 235.	W. Ind.	Cor.	$28\frac{1}{2} \times 2\frac{1}{4}$
53	1253	Sam. 1309.	do. No. 283.	W. Ind.	Cor.	18×2
54	1253	Sam. 1309.	do. No. 310.	W. Ind.	Cor.	$32\frac{1}{2} \times 2$
55	1258	Sam. 1314.	do. No. 222.	W. Ind.	Cor.	$23\frac{1}{2} \times 2$
56	1259	Sam. 1315.	Kielhorn, No. 62.	W. Ind.	Cor.	$14\frac{1}{2} \times 2$
57	1261	Nep. 381.	Add. 1706, Bendall.	Nep.	Cor.	$11\frac{1}{2} \times 1\frac{1}{2}$
58	1261	Sam. 1317.	Peterson ⁵ , No. 8.	W. Ind.	Cor.	17×2
59	1264	Sam. 1320.	do. No. 59.	W. Ind.	Cor.	33×2
60	1264	Nep. 384.	Add. 1465, Bendall.	Nep.	Cor.	13×2
61	1266	Sam. 1322.	Peterson ³ , No. 260.	W. Ind.	Cor.	$32\frac{3}{4} \times 2\frac{1}{2}$
62	1269	Sam. 1325.	do. No. 199.	W. Ind.	Cor.	$17\frac{1}{2} \times 1\frac{1}{2}$
63	1270	Sam. 1326.	do. No. 231.	W. Ind.	Cor.	$28\frac{1}{2} \times 2\frac{1}{2}$
64	1271	Sam. 1327.	do. No. 256.	W. Ind.	Cor.	$33\frac{1}{2} \times 2\frac{1}{4}$
65	1272	Sam. 1328.	do. No. 290.	W. Ind.	Cor.	27×2
66	1275	Sam. 1331.	Peterson ⁵ , No. 35.	W. Ind.	Cor.	$32 \times 2\frac{1}{2}$
67	1280	Sam. 1336.	do. No. 32.	W. Ind.	Cor.	15×2
68	1286	Sam. 1342.	Kielhorn, No. 5.	W. Ind.	Cor.	$32\frac{1}{2} \times 2\frac{1}{4}$
69	1287	Sam. 1343.	Peterson ⁵ , No. 27.	W. Ind.	Cor.	$31\frac{1}{2} \times 2$
70	1302	Nep. 422.	Add. 1306, Bendall.	Nep.	Cor.	13×2
71	1303	Sam. 1359.	Kielhorn, No. 37.	W. Ind.	Cor.	$30\frac{1}{2} \times 2\frac{1}{4}$
72	1320	Sam. 1376.	Peterson ³ , No. 262.	W. Ind.	Cor.	$37\frac{1}{2} \times 2\frac{3}{4}$
73	1324	Sam. 1380.	do. No. 253.	W. Ind.	Cor.	$33 \times 2\frac{1}{4}$
74	1327	Sam. 1383.	do. No. 285.	W. Ind.	Cor.	$19\frac{1}{2} \times 2$
75	1331	Sam. 1387.	do. No. 259.	W. Ind.	Cor.	$35\frac{1}{2} \times 2\frac{1}{2}$

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
76	1334	Sam. 1390.	Peterson ⁵ , No. 84.	W. Ind.	Cor.	17 × 2½
77	1335	Sam. 1391.	Peterson ³ , No. 295.	W. Ind.	Cor.	35¾ × 2½
78	1336	Sam. 1392.	Peterson ⁵ , No. 77.	W. Ind.	Cor.	15 × 2
79	1342	Sam. 1398.	do. No. 85.	W. Ind.	Cor.	17 × 2
80	1355	Nep. 475.	Add. 1697, (viii), Bendall.	Nep.	Cor.	12 × 2
81	1360	Nep. 480.	Add. 1409, Bendall.	Nep.	Cor.	13 × 2
82	1360	Sam. 1416.	Notices, No. 3308.	Beng.	Cor.	10 × 1½
83	1369	Sam. 1425.	Peterson ⁵ , No. 58.	W. Ind.	Cor.	32 × 3
84	1374	Nep. 494.	Add. 1689, Bendall.	Nep.	Cor.	16 × 2
85	1380	Nep. 500.	Add. 1685 do.	Nep.	Cor.	13½ × 2
86	1384	Nep. 504.	Add. 1488 do.	Nep.	Cor.	9 × 2
87	1386	Nep. 506.	Add. 1698 do.	Nep.	Cor.	13 × 2
88	1389	Nep. 509.	Add. 1701 do.	Nep.	Cor.	12 × 2
89	1389	Sam. 1445.	Peterson ³ , No. 304.	W. Ind.	Cor.	34½ × 1½
90	1392	Nep. 512.	Add. 1108, Bendall.	Nep.	Cor.	13 × 2
91	1395	Sam. 1451.	Peterson ³ , No. 223.	W. Ind.	Cor.	14 × 1½
92	1398	Sam. 1454.	Peterson ⁵ , No. 48.	W. Ind.	Cor.	33 × 2
93	1400	Sam. 1456.	do. No. 28.	W. Ind.	Cor.	25 × 1½
94	1412	Nep. 532.	Add. 1649, Bendall.	Nep.	Cor.	12½ × 2
95	1412	Nep. 532.	Add. 1691 (iv), Bendall.	Nep.	Cor.	12 × 2
96	1425	Nep. 545.	Add. 1661 do.	Nep.	Cor.	13 × 2
97	1427	Nep. 547.	Add. 1580 do.	Nep.	Cor.	10 × 2
98	1429	Nep. 549.	Add. 1703 do.	Nep.	Cor.	11½ × 2
99	1440	Nep. 560.	Add. 1691, (iii) do.	Nep.	Cor.	12 × 2
100	1457	Nep. 577.	Add. 1708, (i) do.	Nep.	Cor.	12 × 2
101	1460	Laks. 355.	Notices, No. 1889.	Bih.	Cor.	12 × 1½
102	1463	Nep. 583.	Add. 1697 (iv), Bendall.	Nep.	Cor.	12 × 2
103	1468	Laks. 363.	Notices, No. 1913.	Bih.	Cor.	13 × 2

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
104	1495	Çak. 1417.	Notices, No. 1974.	Beng.	Cor.	10 × 2
105	1518	Çak. 1440.	do. No. 1070.	Beng.	Cor.	14 × 2½
106	1526	Lakş. 421.	do. No. 1963.	Bih.	Cor.	11 × 2
107	1529	Lakş. 424.	do. No. 2390.	Bih.	Cor.	16 × 2
108	1535	Çak. 1457.	do. No. 1978.	Beng.	Cor.	15 × 1¾
109	1536	Lakş. 431.	do. No. 1967.	Bih.	Cor.	11 × 2
110	1540	Lakş. 435.	do. No. 1907.	Bih.	Cor.	11 × 1½
111	1556	Çak. 1478.	do. No. 2129.	Beng.	Cor.	10 × 2
112	1564	Lakş. 459.	do. No. 1909.	Bih.	Cor.	12 × 1½
113	1571	Çak. 1493.	do. No. 2172.	N. Beng.	Cor.	12 × 2
114	1576	Nep. 596.	Add. 1355, Bendall.	Nep.	Cor.	9½ × 2
115	1607	Lakş. 502.	Notices, No. 1879.	Bih.	Cor.	11 × 2
116	1609	Lakş. 504.	do. No. 1922.	Bih.	Cor.	12 × 2
117	1617	Lakş. 512.	do. No. 2405.	Bih.	Cor.	17 × 2
118	1618	Çak. 1540.	do. No. 2749.	Beng.	Bor.	12 × 1½
119	1619	Nep. 739.	Add. 1662, Bendall.	Nep.	Cor.	12 × 2
120	1622	Çak. 1544.	Notices, No. 2252.	Bih.	Cor.	14 × 2½
121	1624	Çak. 1546.	do. No. 1992.	Bih.	Cor.	11 × 2
	1610	Lakş. 505.				
122	1627	Lakş. 522.	do. No. 2364.	Bih.	Cor.	14 × 1½
123	1629	Çak. 1551.	do. No. 3382.	Beng.	Cor.	10 × 2
124	1629	Çak. 1551.	do. No. 2000.	Bih.	Cor.	10 × 2
125	1643	Lakş. 538.	do. No. 2399.	Bih.	Cor.	16 × 1½
126	1660	Lakş. 555.	do. No. 1910.	Bih.	Cor.	14 × 2
127	1673	Lakş. 568.	do. No. 1968.	Bih.	Cor.	12 × 1½
128	1678	Çak. 1600.	do. No. 2126.	Beng.	Bor.	10 × 1½
129	1680	Çak. 1602.	do. No. 2759.	Beng.	Cor.	18 × 2
130	1687	Çak. 1609.	do. No. 1645.	W. Beng.	Bor.	19 × 1½
131	1688	Çak. 1610.	do. No. 1642.	W. Beng.	Bor.	19 × 1¾

No.	A.D.	Date.	Reference.	Loc.	Mat.	Measure.
132	1689	Lakṣ. 584.	Notices, No. 1987.	Bih.	Cor.	12 × 2½
133	1701	Çak. 1623.	do. No. 1643.	W. Beng.	Bor.	14 × 1½
134	1727	Çak. 1649.	do. No. 2370.	Bih.	Cor.	22 × 2
135	1732	Çak. 1654.	do. No. 2917.	W. Beng.	Cor.	22 × 2
136	1734	Çak. 1656.	do. No. 2965.	W. Beng.	Bor.	11 × 1½
137	1739	Çak. 1661.	do. No. 1845.	Bih.	Cor.	15½ × 2
138	1755	Çak. 1677.	do. No. 2068.	N. Beng.	Cor.	40 × 2
139	1785	Çak. 1707.	do. No. 2069.	N. Beng.	Cor.	19 × 2
140	1804	Çak. 1726.	do. No. 1129.	Beng.	Bor.	3 or 4 lines
141 ⁸	1836	Lakṣ. 731.	do. No. 1764.	Bih.	Bor.	11 × 1

In Table III, I have included none but such palm-leaf MSS., of which exact dates and measurements have been recorded. On the other hand, I have included all manuscripts, satisfying those two conditions, records of which were accessible to me: in fact, Table III, so far as I know, practically includes all such palm-leaf MSS., of which any record exists at all. I do not think it likely that any appreciable number of dated and measured manuscripts have been omitted. Those entered in Table III belong to the collections, noticed in Bendall's Catalogue of Cambridge MSS., Dr. Mitra's Notices of Sanskrit MSS., and Peterson's and Kielhorn's Reports on the Search for Sanskrit MSS. in the Bombay Presidency.⁹

As I have not actually seen and examined any of the manuscripts entered in Table III, the only test for determining their material are their measurements, especially those of their width. Now there are

⁸ The description of this manuscript in the "Notices" is wrong. It is said to be dated "L. S. 431=A.D. 1537," but at the same time it is described as "fresh" in appearance. The fact is, the date which is in numeral words has been wrongly read. *Ambudhi* means "seven"; and the date is Lakṣ. 731=A.D. 1836. Unfortunately the manuscript is missing from the Calcutta collection; I have not been able to see it. I may here note that though in the older usage "ocean" signifies "four," in the more modern and in the present usage it means "seven." The *Çabda-kalpa-druma* gives both meanings.

⁹ "Peterson³" and "Peterson⁵" in the References of Table III mean Professor Peterson's Third Report, 1884-86 (Extra Number in the Journal, Bombay Branch of the Royal Asiatic Society), and his Fifth Report, 1892-95, respectively. "Kielhorn" means Professor Kielhorn's Report for 1880-81.

in the list of Table III, 127 manuscripts, dating before 1675 A.D. Of these 127 manuscripts, 104 measure $1\frac{3}{4}$ inches or upwards in width. All these must be written on Corypha leaves; for I have already shown that no Borassus leaf admits of that width. Practically the same remark applies to No. 36, which measures $1\frac{2}{3}$ inches. There remain 22 manuscripts, measuring less than $1\frac{3}{4}$ inches in width. Of these, 18 have a width of $1\frac{1}{2}$ inches.¹⁰ There is very little probability of any of them being a Corypha manuscript: in fact, in the case of No. 57, the fact that it is written on Corypha leaves has been verified for me by Professor Cowell; and as to 6 others, *viz.*, Nos. 101, 110, 112, 122, 125 and 127, which are Bihār manuscripts, I shall show presently that in Bihār none but Corypha leaves were used down to a far more recent date than 1675 A.D. Of the remaining 4 manuscripts, No. 89, which is $1\frac{1}{3}$ inches wide, cannot be Borassus, because of its length of $34\frac{1}{2}$ inches; nor are Nos. 5, 8 and 10, which are $1\frac{1}{4}$ and 1 inches wide respectively, likely to be Borassus, on account of their great age: that exceptionally Corypha manuscripts of such very small width are met with, I have already shown (see Nos. 35 and 55 in Table I, and No. 5 in Table II).

It thus appears that (with the exception of one manuscript, No. 118, presently to be referred to) all the manuscripts dating before 1675 A.D. are written on Corypha leaves,—a result which exactly agrees with that obtained from Table I. It is a striking fact that no dated and measured manuscript which can indubitably be proved to be written on Borassus leaves has as yet come to light, dating from before 1675 A.D., or at least (to be quite exact, with a view to the two exceptional cases of No. 60 in Table I, and No. 118 in Table III), dating from before the end of the 16th century. If Borassus manuscripts did exist, it is more than strange that not one of them should have been discovered: it is equally improbable that they—all and every one—should have perished. The only reasonable conclusion, from the facts presented, is that Borassus leaves were not used at all for book-writing in Northern India before the end of the 16th century, nor used generally before about 1675 A.D.

The exceptional case of No. 118 in Table III, dated 1618 A.D., is noteworthy. It stands, quite by itself among the surrounding Corypha manuscripts. For the next Borassus MS. we have to go down to No. 128, and the year 1678 A.D. It is also a South-Bengali manuscript. Its case agrees in every way with that of No. 60 in Table I, which has already been referred to. It must be added, however, that it is by no means certain that No. 118 is really a Borassus manuscript. Judged by

¹⁰ These are Nos. 7, 9, 21, 25, 26, 30, 37, 41, 57, 82, 91, 93, 101, 110, 112, 122, 125, 127.

its measurements it might very well be a *Corypha* manuscript. But the probability perhaps is the other way, and I have accordingly treated it so.

This leads me to the next point. Table I shows that the use of *Borassus* leaves for book-writing was, and still is, limited to the Eastern portion of Northern India, *i.e.*, to Bengal, Bihār and Orissa. In the rest of Northern India (including Nepal, and "Western India" north of Bombay), *Borassus* has never been used for that purpose: there none but *Corypha* leaves were used at all; but as I shall show further on, the use of palm-leaves for book-writing died out there as early as the middle of the 15th century on the west-coast, and in the interior even some centuries earlier. At the time when the use of *Borassus* came in in the eastern provinces of Northern India, *viz.*, in the 17th century, the use of paper had in its central and western provinces long superseded that of palm-leaves.

Even with regard to Eastern India, a striking difference shows itself between the three provinces composing it. In Bengal the use of the *Borassus* leaf makes its first appearance in a sporadic way, at the end of the 16th century, and we find it fully established a century later, from about 1675 A.D. On the contrary, in Bihār the exclusive use of *Corypha* leaves continues down to the middle of the 18th century, while in Orissa *Corypha* leaves appear to have never been used at all.

To illustrate these conclusions I have prepared the following three Tables of Bengal, Bihār and Orissa palm-leaf manuscripts respectively.

TABLE IV. BENGAL PALM-LEAF MSS.

No.	A. D.	Date.	Reference.	Measures.	Material.
1	1360	Sam. 1416.	Table III, No. 82.	$10 \times 1\frac{1}{2}$	Cor.
2	1386	Sam. 1442.	Table I, No. 45.	11×2	Cor.
3	1495	Çak. 1417.	Table III, No. 104.	10×2	Cor.
4	1514	Çak. 1436.	Table I, No. 53.	$14\frac{1}{2} \times 1\frac{3}{4}$	Cor.
5	1518	Çak. 1440.	Table III, No. 105.	$14 \times 2\frac{1}{2}$	Cor.
6	1531	Çak. 1453.	Table I, No. 54.	$13\frac{1}{2} \times 2$	Cor.
7	1535	Çak. 1457.	Table III, No. 108.	$15 \times 1\frac{3}{4}$	Cor.
8	1553	Çak. 1475.	Table J, No. 55.	$1\frac{1}{4}$	Cor.
9	1556	Çak. 1478.	Table III, No. 111.	10×2	Cor.
10	1571	Çak. 1493.	do. No. 112.	12×2	Cor.

No.	A.D.	Date.	Reference.	Measure.	Material.
11	1572	Çak. 1494.	Table I, No. 57.	$13\frac{3}{4} \times 1\frac{1}{2}$	Cor.
12	1587	Çak. 1509.	do. No. 60.	$12 \times \begin{cases} 1\frac{7}{8} \\ 1\frac{1}{2} \end{cases}$	Cor. Bor.
13	1594	Çak. 1516.	do. No. 60.	$12 \times 1\frac{1}{2}$	Bor.
14	1618	Çak. 1540.	Table III, No. 118.	$12 \times 1\frac{1}{2}$	Bor.
15	1629	Çak. 1551.	do. No. 122.	10×2	Cor.
16	1675	Çak. 1597.	Table I, No. 70.	$1\frac{3}{8}$	Bor.
17	1677	Çak. 1599.	do. No. 71.	$1\frac{1}{2}$	Bor.
18	1678	Çak. 1600.	Table III, No. 128.	$10 \times 1\frac{1}{2}$	Bor.
19	1678	Çak. 1600.	Table I, No. 72.	$15\frac{1}{4} \times 2$	Cor.
20	1680	Çak. 1602.	Table III, No. 129.	18×2	Cor.
21	1687	Çak. 1609.	do. No. 130.	$19 \times 1\frac{1}{2}$	Bor.
22	1687	Çak. 1609.	Table I, No. 76.	$11 \times 1\frac{3}{8}$	Bor.
23	1688	Çak. 1610.	do. No. 77.	$20 \times 1\frac{1}{2}-1$	Bor.
24	1688	Çak. 1610.	Table III, No. 131.	$19 \times 1\frac{1}{4}$	Bor.
25	1689	Çak. 1611.	Table I, No. 78.	$14 \times 1\frac{1}{2}$	Bor.
26	1701	Çak. 1623.	Table III, No. 134.	$14 \times 1\frac{1}{2}$	Bor.
27	1721	Çak. 1643.	Table I, No. 82.	$2\frac{1}{4}$	Cor.
28	1732	Çak. 1654.	Table III, No. 136.	22×2	Cor.
29	1734	Çak. 1656.	do. No. 137.	$11 \times 1\frac{1}{2}$	Bor.
30 ¹¹	1755	Çak. 1677.	do. No. 138.	40×2	Cor.
31	1785	Çak. 1707.	do. No. 139.	19×2	Cor.
32	1804	Çak. 1726.	do. No. 140.	3 or 4 ll., $1\frac{1}{4}$	Bor.
33	1815	Çak. 1737.	Table I, No. 87.	$14\frac{1}{2} \times 1\frac{1}{2}-1$	Bor.

It will be seen from Table IV, that up to 1587 A.D. *Corypha* leaves were in exclusive use in Bengal. In that year the first trace of the use of *Borassus* leaves makes its appearance. In 1594 there is the

¹¹ It will be noticed that the length of this manuscript (40 inches) is out of all proportion to that of all other Bengal manuscripts. I am, therefore, disposed to suspect a misprint in its record in "Notices," No. 2068.

first manuscript wholly written on *Borassus* leaves; another follows in 1618 A.D. Then comes a long interval of 57 years, up to 1675 A.D., in which there is one *Corypha* manuscript, in 1629 A.D. But from 1675, when there are numerous manuscripts recorded at very short intervals, the use of *Borassus* shows itself dominant. Among 18 manuscripts, between 1675 and 1815 A.D., there are 12 *Borassus* and only 6 *Corypha* ones; that is $\frac{2}{3}$ of the whole are *Borassus* manuscripts.

The oldest known Bengal palm-leaf manuscript is referable to the year 1360 A.D. Another described in "Notices," No. 1977, was thought by the late Rāja R. L. Mitra to be older, being supposed to be dated in Lakṣ. 102=1207 A.D. It is a *Corypha* MS., measuring $13\frac{1}{2} \times 2\frac{1}{4}$, and is certainly very old, but its date, if any, is not decipherable, and on palæographic grounds it is more likely to belong to the end of the 14th century.

TABLE V. BIHĀR PALM-LEAF MSS.

No.	A. D.	Date.	Reference.	Measure.	Material.
1	1020	5 Mahipāla.	Table I, No. 8.	$21 \times 2\frac{1}{8}$	Cor.
2	1054	14 Nayapāla.	Table III, No. 2.	22×2	Cor.
3	1120	15 Rāmapāla.	Table I, No. 16.	$22 \times 2\frac{1}{4}$	Cor.
4	1165	4 Gōvindapāla.	do. No. 21.	$22\frac{1}{2} \times 2\frac{1}{2}$	Cor.
5	1185	24 do.	do. No. 25.	$11\frac{3}{4} \times 2$	Cor.
6	1199	38 do.	do. No. 27.	$11\frac{1}{2} \times 2\frac{3}{8}$	Cor.
7	1319	Lakṣ. 214.	do. No. 37.	$15\frac{3}{4} \times 1\frac{7}{8}$	Cor.
8	1446	Sam. 1503.	do. No. 47.	$13\frac{1}{8} \times 2\frac{1}{4}$	Cor.
9	1450	Lakṣ. 345.	do. No. 48.	$13 \times 1\frac{1}{2}$	Cor.
10	1460	Lakṣ. 355.	Table III, No. 101.	$12 \times 1\frac{1}{2}$	Cor.
11	1467	Lakṣ. 362.	Table I, No. 49.	13×2	Cor.
12	1468	Lakṣ. 363.	Table III, No. 103.	13×2	Cor.
13	1479	Lakṣ. 374.	Table I, No. 50.	$11\frac{1}{2} \times 2$	Cor.
14	1504	Lakṣ. 399.	do. No. 51.	$14\frac{1}{2} \times 2\frac{1}{2}$	Cor.
15	1513	Lakṣ. 408.	do. No. 52.	$13\frac{3}{4} \times 1\frac{1}{8}$	Cor.
16	1526	Lakṣ. 421.	Table III, No. 106.	11×2	Cor.
17	1529	Lakṣ. 424.	do. No. 107.	16×2	Cor.

No.	A.D.	Date.	Reference.	Measure.	Material.
18	1536	Lakş. 431.	Table III, No. 109.	11 × 2	Cor.
19	1540	Lakş. 435.	do. No. 110.	11 × 1½	Cor.
20	1557	Lakş. 452.	Table I, No. 56.	13⅜ × 2	Cor.
21	1564	Lakş. 459.	Table III, No. 112.	12 × 1½	Cor.
22	1575	Lakş. 470.	Table I, No. 58.	13½ × 2¼	Cor.
23	1607	Lakş. 502.	Table III, No. 115.	11 × 2	Cor.
24	1608	Lakş. 503.	Table I, No. 62.	13½ × 1⅞	Cor.
25	1609	Lakş. 504.	do. No. 63.	13¾ × 2	Cor.
26	1609	Lakş. 504.	Table III, No. 116.	12 × 2	Cor.
27	1616	Lakş. 511.	Table I, No. 64.	14⅛ × 1⅝	Cor.
28	1617	Lakş. 512.	Table III, No. 117.	17 × 2	Cor.
29	1622	Çak. 1544.	do. No. 120.	14 × 2½	Cor.
30	$\frac{1624}{1610}$	$\frac{\text{Çak. 1546}}{\text{Lakş. 505}}$	do. No. 121.	11 × 2	Cor.
31	1627	Lakş. 522.	do. No. 122.	14 × 1½	Cor.
32	1629	Çak. 1551.	do. No. 124.	10 × 2	Cor.
33	1633	Çak. 1555.	Table I, No. 65.	12 × 1⅝	Cor.
34	1643	Lakş. 538.	Table III, No. 125.	16 × 1½	Cor.
35	1647	Çak. 1569.	Table I, No. 66.	11¼ × 2	Cor.
36	1660	Lakş. 555.	Table III, No. 126.	14 × 2	Cor.
37	1661	Lakş. 556.	Table I, No. 67.	12¾ × 1½	Cor.
38	1668	Çak. 1590.	do. No. 68.	7⅞ × 1¾	Cor.
39	$\frac{1669}{1660}$	$\frac{\text{Çak. 1591}}{\text{Lakş. 555}}$	do. No. 69.	7 × 1⅝	Cor.
40	1673	Lakş. 568.	Table III, No. 127.	12 × 1½	Cor.
41	1680	Çak. 1602.	Table I, No. 73.	14 × 1¾	Cor.
42	1689	Lakş. 584.	Table III, No. 132.	12 × 2½	Cor.
43	1727	Çak. 1649.	do. No. 134.	22 × 2	Cor.
44	1739	Çak. 1661.	do. No. 137.	15½ × 2	Cor.
45	1836	Lakş. 731.	do. No. 141.	11 × 1	Bor.

Among the 45 manuscripts listed in this Table, there are 35 which, as their width shows, are undoubtedly written on *Corypha* leaves. There are only eight MSS. (Nos. 9, 10, 19, 21, 31, 34, 37 and 40) which, by their width of $1\frac{1}{2}$ inches, might be written on *Borassus* leaves. But their age, as well as their isolated position among *Corypha* manuscripts, renders it certain that they are also *Corypha* manuscripts. Indeed, as a matter of fact, Nos. 9 and 37, which I have myself inspected, are *Corypha* manuscripts. I may add that down to 1739 A.D. (No. 44) I have not found, among all the Bihār MSS. that I have examined and measured, a single manuscript written on *Borassus* leaves. So far, therefore, as evidence, at present available, goes, it points to the fact that, down to the middle of the 18th century, *Corypha* leaves were in exclusive use in Bihar for book-writing. About that time, perhaps, the use of *Borassus* leaves may have been introduced from Bengal; for No. 45, of 1836 A.D., is evidently a *Borassus* manuscript. Any how, in the present day, as I learn from special enquiries made by me, both kinds of palm-leaf are in use in Bihār, though, for book-writing at least, paper has nearly entirely superseded palm-leaf, so that it is very difficult now-a-days to obtain a quite modern palm-leaf manuscript. In fact, in spite of persistent endeavours, I have failed to obtain for personal inspection a single Bihār palm-leaf manuscript of the 18th and 19th centuries. This remark, regarding the supercession of palm-leaf by paper, also applies to Bengal, but not to Orissa.

With regard to Orissa I am in a somewhat unsatisfactory position. Palm-leaf manuscripts, written in Oriya, are very uncommon in Calcutta, and the majority of those one meets with are not dated. Moreover the few manuscripts which bear some date are not dated in any era, but merely in the regnal years of certain kings. I have been able to examine the following seven manuscripts:—

TABLE VI.¹² ORISSA PALM-LEAF MSS.

No.	A.D.	Date.	Reference.	Measures.	Mat.
1	1660-92	Some year of Mukunda	Govt. Ind.	$1\frac{5}{16}$	Bor.
2	1683	24th do. ...	do.	$15 \times 1\frac{3}{8}$	Bor.
3	1683	24th do. ...	do.	$1\frac{1}{4}$	Bor.
4	1690	31st do. ...	No. 2837 in Notices.	$16 \times 1\frac{1}{4}$	Bor.
5	1708	17th of Divya Simha...	Govt. Ind.	$14\frac{9}{16} \times 1\frac{1}{2}$	Bor.
6	1752	10th of Kēçari ...	do.	$14\frac{3}{4} \times 1\frac{3}{8}$	Bor.
7	1766	24th of do. ...	do.	$15 \times 1\frac{3}{8}$	Bor.

¹² On the chronology of the kings of Orissa, see Prinsep's *Useful Tables*, p. 267 (in Vol. II of his *Indian Antiquities*, ed. Thomas), also Hunter's *Orissa* and

I have also examined seven other manuscripts which are undated. Their width varied from 1 to $1\frac{1}{2}$ inches, and their number of lines from 3 to 6. They were made of *Borassus flab.* Their general appearance indicates them as being of the same period as the dated ones.

I have not met with any Oriya palm-leaf manuscript of an earlier date than the 24th year of Mukunda Dēva, or A.D. 1683, though No. 1 may go back to 1660. So far as this evidence goes, it shows that Oriya palm-leaf manuscripts are not older than the second half of the 17th century, and are invariably written on *Borassus* leaves. The evidence, however, is not complete. It seems to be certain that the Oriyā characters were not employed in Orissa before the 15th century A.D. The earliest epigraphical record in Oriyā characters is an inscription, dated 1436 A.D., of Kapilēçvara Dēva. The earlier inscriptions of the 13th and 14th centuries are in a species of early Bengali characters.¹⁵ It is not impossible therefore, that manuscripts may have been written in Oriyā characters as early as the 15th century A.D. Possibly among the undated manuscripts some may go back to such an early date; and it is also possible that dated manuscripts of that early period may yet come to light. In the latter case it is probable that they will be found to be *Borassus* manuscripts; for hitherto not a single manuscript written in Oriyā characters is known to exist which is written on *Corypha* leaves. At present, however, there is a gap of 200 or 250 years (about 1436–1660 A.D.) in the evidence. On the whole, the probability is that the case of Orissa is much the same as that of Bengal. If *Corypha* leaves were ever used in Orissa at all, their use must have gone out of fashion, as it did in Bengal, in the course of the 16th century. At present, **the available evidence**

elsewhere. The exact periods of the several reigns are only approximately known. There were three Mukundas and two Divya Simhas. The former reigned 17, 32, and 19 years respectively; accordingly it must be Mukunda II who is referred to in Table VI, and who reigned, approximately, from 1660 to 1692 A.D. The two Divya Simhas reigned 28 and 18 years respectively; probably it is Divya Simha I who is here intended, and who reigned from 1692–1720 A.D. Kēçari Dēva (in Prinsep, *Bir Kishore Deo*) reigned from 1743–1780 A.D. In the manuscripts the reigns of these kings are quoted in *aykas*. On the method of converting these *aykas* into regnal years, see Bābū Mon Mohan Chakravarti's explanation in *Journal, A.S.B.* vol. LXII, (1893), p. 89. The number *one* and all numbers ending with zero (except 10) or with 6 are omitted. Hence the 29th *ayka* of Mukunda is equal to his 24th year; *i.e.*, 5 *aykas* (1, 6, 16, 20, 26) are omitted; and so forth. The *aykas* of Table VI are: 38 (No. 4), 29 (Nos. 2, 3 and 7), 21 (No. 5), 12 (No. 6). No. 1 simply refers to the reign of Mukunda.

¹⁵ See *Journal, A.S.B.* Vol. LXII (1893), p. 88, 89. Also *ibidem*, Vol. LXIV (1895) and Vol. LXV (1896).

is dead against the use of *Corypha* leaves in Orissa. Not a single *Corypha* manuscript in Oriyā characters has as yet been discovered.

Let us now turn to Western India. Here we have the careful catalogues prepared by Professors Kielhorn, Peterson and Bhandarkar. In his Report for 1880-81, Prof. Kielhorn describes 77 palm-leaf MSS. from Pātān. Prof. Peterson in his 3rd Report for 1885-86, describes 157 palm-leaf MSS. from Cambay (Nos. 181-338), and in his 5th Report for 1892-95 he describes 93 palm-leaf MSS. from Pātān. Measurements, however, are only given of 69, 147 and 62 manuscripts respectively of the three sets. The total of measured manuscripts accordingly is 278. Among these there are :

(1) MSS. measuring $1\frac{3}{4}$ inches and more,	230
(2) MSS. „ $1\frac{1}{2}$ inches	38
(3) MSS. „ less than $1\frac{1}{2}$	10

This statement includes both kinds of manuscripts, undated as well as dated ones, and, therefore, supplements the information given in Table III.

The first-placed manuscripts, of course, as shown by their width, must be *Corypha* ones; so also, are in all probability, the 38 manuscripts of the width of $1\frac{1}{2}$ inches. More doubtful might seem the case of those ten which measure less than $1\frac{1}{2}$ inches. Among these there are 8 manuscripts which are said to measure only $1\frac{3}{8}$, $1\frac{1}{3}$, or $1\frac{1}{4}$ inches, and two manuscripts which are said even to be only one inch wide.¹⁴ Four of these 10 manuscripts, being dated, will be found included in Table III; *viz.*, Nos. 10 (1" wide), 5 and 8 ($1\frac{1}{4}$ "), and 89 ($1\frac{1}{3}$ "); and in connection with that Table it has been shown what little probability there is that any of these 10 manuscripts should be *Borassus* ones. As a matter of fact (I may add here), I have found by ocular examination of Kielhorn's No. 34 (or No. 35 in Table I) that among its leaves there are some which are only $1\frac{1}{4}$ inches wide, but which still are *Corypha* leaves: which circumstance shows that extreme narrowness of the leaves need not preclude their being *Corypha*. It may, therefore, be taken for certain that in Western India none but *Corypha* leaves were ever used for book-writing.

We will now turn to the paper manuscripts. For Eastern India (Bengal, Behar and Orissa) the "Notices of Sanskrit Manuscripts" afford a fair statistical text. I have classified all the dated paper MSS. which are enumerated in volumes I to X, according to centuries, down to 1850, in the subjoined Table VII, in which I have added similar information,

¹⁴ These are Peterson's Nos. 7, 63 (both one inch), Peterson's No. 13, Kielhorn No. 40, Peterson's Nos. 50, 66 (all four, $1\frac{1}{4}$ "); Peterson's Nos. 304, 305, 308 (all, $1\frac{1}{3}$ "); Peterson's No. 216 ($1\frac{3}{8}$ ").

for Western India, gathered from the Reports of Professors Bhandarkar, Kielhorn and Peterson.¹⁵ For my present statistical purpose these Reports, unfortunately, are not so well fitted as the "Notices;" still such as they are, their evidence distinctly tends in the same direction. A considerable portion of the manuscripts described in the "Notices" belong to the North-West Provinces and Oudh, which form the central portion of Northern India. Accordingly the column for the "Notices" is divided into East and Centre.

TABLE VII.

PERIODS.	NOTICES.		BHANDARKAR.	KIELHORN.	PETERSON.				
	East.		Centre.	West.					
	Palm-leaf.	Paper.	Paper.	Palm-leaf.	Paper.	Palm-leaf.	Paper.	Palm-leaf.	Paper.
(1) 1050-1150				7		6		14	
(2) 1150-1250			1	14		5		68	
(3) 1250-1350			1	13	1	6		46	
(4) } 1350-1400	2	1	1	3	2		2	4	10
(5) } 1400-1450		1	4		5	2	9	1	27
(6) 1450-1550	12	7	8		20		47		61
(7) 1550-1650	16	14	40		61		53		162
(8) 1650-1750	18	56	70		93		65		240
(9) 1750-1850	5	107	201		96		48		369

The general drift of this evidence is to show that from the end of the 13th and the beginning of the 14th centuries paper began to

¹⁵ These are Bhandarkar's Report for 1882-83; Kielhorn's Report for 1880-81, containing also a list of the collection in 1873-74; Peterson's Second Report for 1882-83 (being an Extra Number of the Journal of the Bombay Branch of the Royal Asiatic Society for 1883); his Third Report for 1884-86 (being another Extra Number for 1887); his Fifth Report, for 1892-95, and his Sixth Report, for 1895-98.

supersede palm-leaf as a material for writing books. The drop in the number of palm-leaf manuscripts between the third and fourth periods is very noticeable; and from the fourth period onwards there is a steady and marked rise in the number of paper manuscripts.

In Western India the supersession of palm-leaf was far more thorough than in Eastern India. **About the middle of the 15th century**,—so far as the evidence at present available goes,—**the use of palm-leaf entirely ceases in Western India.** The three latest palm-leaf manuscripts are dated, one in A.D. 1449 (Sam. 1505), and two in A.D. 1400 (Sam. 1456): see Kielhorn's Report, p. v, and Peterson's Fifth Report, p. 51. During the same period (1400-1449) we have 41 paper manuscripts. The earliest paper manuscript is dated A.D. 1320 (Sam. 1376): see Bhandarkar's Report, p. 51. Then follow 14 paper manuscripts, dated between A.D. 1360 and 1395. This total cessation of the use of palm-leaf at this period is nothing new: it has already been pointed out by Professor Bhandarkar in his Report, pp. 51 and 52.

In Eastern India the use of palm-leaf continued more or less by the side of paper. The Table shows a steady and marked rise in the number of paper manuscripts, while the number of palm-leaf manuscripts remains practically stationary, ending with a marked drop in the last period. This, of course, really implies a steady decrease in the use of palm-leaf, ending with a practically total cessation, in the present day.¹⁶ In Orissa alone its use continuous to some extent. The two latest recorded palm-leaf manuscripts (both not on Corypha, but Borassus leaves) are dated A.D. 1815 (Çaka 1737; "Notices," No. 1607, Table I, No. 87) and A.D. 1836 (Lakṣ. 731, "Notices," No. 1764, Table III, No. 141). The earliest paper manuscript is dated A.D. 1354 (Sam. 1410), and is a Behar (Maithili) manuscript, No. 1999 in the "Notices." The oldest Bengal paper manuscript is dated A.D. 1404 (Çaka 1326), being No. 2082 in the "Notices." These are two exceptional cases: **the real use of paper in Eastern India only commences about A.D. 1450, that is about one century later than in Western India.**

But the earliest paper manuscript of all, examined by me, is one in the Sanskrit College in Calcutta. It is No. 582 in Volume I of its Library Catalogue, and is dated A.D. 1231 (Sam. 1288).¹⁷ The oldest

¹⁶ Exceptionally, and for a very limited class of certain religious books, palm-leaf is said to be still used in Bengal.

¹⁷ The Calcutta Sanskrit College, in its Library Catalogue, professes to possess extraordinarily old paper manuscripts. No. 553 in Vol. I is said to be dated in 1017 A.D. or Sam. 1073; No. 371 in 1059 A.D. or Sam. 1115, No. 122 in Vol. II. in 1178 A.D. or Sam. 1234; No. 582 in Vol. I. in 1212 A.D. or Sam.

paper manuscript of all, mentioned in the "Notices" is No. 2043. It is dated A.D. 1343 (Sam. 1399), and has no string-hole, but in its place a small read disk, about $\frac{3}{8}$ " diameter. These two earliest paper manuscripts are shown in Table VII in the column for "Notices," under the heading "Centre." They are both written in a distinctly Western type of Nāgarī, and must have been written somewhere in the North-West Provinces: they do not properly belong to Eastern India. Under the heading "Centre" are entered paper manuscripts written in Nāgarī (not in Bengali, neither in Maitihili) characters. All these properly belong to the North-West Provinces or Oudh, *i.e.*, to the Central part of Northern India. It may be noticed that no palm-leaf manuscripts are recorded for this part of Northern India. This is a noteworthy fact, to which reference will be made subsequently.

To sum up the result of my enquiries into the use of palm-leaf as writing material, it appears that—

(1) Originally none but leaves of the *Corypha umbr.* palm were used throughout India. This state continued down to the 15th century.

(2) From the middle of the 15th century their use was discontinued in Western India, no other kind of palm-leaf replacing them.

(3) From the beginning of the 17th century they ceased to be used in Bengal and probably Orissa, the leaves of the *Borassus fl.* taking their place.

(4) In Behar their exclusive use continued down to the middle of the 18th century.

(5) The use of the *Borassus flab.* is comparatively modern, and it is, and was, nowhere current in Northern India, outside Bengal and Orissa.

(6) Paper began to come into use, in the Centre of Northern India, in Western India and in Eastern India about the middle respectively of the 13th, 14th and 15th centuries.

(7) In the Centre and West it entirely superseded, in the 15th century, the writing-material previously in use, that is, palm-leaf in the West and perhaps birch-bark in the Centre. In the East it maintained a finally successful rivalry until comparatively recent times.

1268; No. 529 in A.D. 1320 or Sam. 1376. I have examined all these manuscripts. They are all written in Nāgarī, and are North-Western manuscripts (not Bengali). No. 553 is as modern a manuscript as one can wish, and is dated Sam. 1873, or A.D. 1817! No. 371 is dated Sam. 1715 or A.D. 1659. No. 122 is dated Sam (*i.e.*, Bengali year, not Saṁvat) 1234, equal to A.D. 1826. No. 582 is doubly dated in Sam. 1288 (not 1268 as the Catalogue reads), and Çaka 1152, which is A.D. 1231 (*viz.*, 1288-57 and 1152+79); this is the only really old paper manuscript. No. 529 is not dated at all, the compiler of the Catalogue having mistaken some blurred Nāgarī akṣaras for numeral figures.

The *Corypha umbraculifera* being a South-Indian tree, it is clear that its leaves, prepared to serve as writing material, must have formed an article of trade from very early times, and been carried as merchandise over the whole of Northern India. The customers of it, of course, were almost wholly limited to the literary classes, who wrote and copied books, *i.e.*, to the learned in schools and monasteries, etc. Paper came in with the Muhammadans, in the 11th century. It only very slowly and gradually displaced the *Corypha* palm-leaf, the use of which had the sanction of age and religion among the conservative Indian literates: they looked with distrust upon the product of the Mlecchas. The paper-makers are still, as a rule, Muhammadans; and there exists no indigenous Sanskrit term for paper, the word universally used being *kāgaḥ* or *kāgaḍ*.¹³ With the 14th century, paper began to grow more widely into favour, and the import trade of *Corypha* leaves proportionately declined. With the beginning of the 17th century we find that paper has displaced the *Corypha* leaves throughout Northern India excepting Behar, and the trade with it had practically ceased. Palm-leaves were still occasionally wanted; and thus it came to pass (so it seems) that the people of Bengal and Orissa took to the use of the *Borassus flabellifer* which grew plentifully in their own country, because they could no more readily obtain suitable *Corypha* leaves in sufficient quantities. It is curious to observe that the literati of Behar were the most conservative in the retention of the use of the *Corypha* leaves; for their latest *Corypha* MS. is dated A.D. 1739 (No. 44 in Table V).

It would seem that the use of the leaves of the *Borassus* palm was introduced into Eastern India from the South. For its use in Southern India can be traced to a much earlier period. As Table II shows, the earliest recorded *Borassus* manuscript in Southern India may be referred to about 1550 A.D., and since that time *Borassus* is generally, though not exclusively, made use of, in Southern India, for book writing; *Corypha* also being used occasionally. The case of Southern India, however, I have not been able to thoroughly investigate. In Ceylon the use of *Corypha* leaves appears to be still predominant; in fact, for book writing, I am informed, it is still in exclusive use. The cause or causes that led to the *Borassus* growing into favour, and more or less displacing the time-honoured *Corypha* are obscure. It

¹³ This is a Hindū corruption of the Persian *kāghaz* (کاغذ), which itself is a corruption of the Chinese *kog-dz*, the name of their "paper made of the bark of the paper-mulberry tree." When the Arabs, in the 8th century, learned paper-making from the Chinese, they adopted the Chinese name for their own paper made of linen rags. See Professor Fr. Hirth's *Indische Studien*, p. 263, and Professor Karabaček's *Führer durch die Ausstellung der Papyrus Erzherzog Rainer*.

would be interesting to know them, and they would be worth investigation. Perhaps it may be found that the Borassus palm was introduced into India only at a comparatively recent period, and being a more useful tree than the Corypha, it was more frequently cultivated, and more extensively employed. Of the Borassus palm almost everything can be used: its fruits and buds are edible, its juice is made into liquor, its leaves can be used for domestic and literary purposes, its trunks are shaped into boats; and so forth. Of the Corypha palm neither the fruit is edible nor the juice potable. Being a far more useful tree, the Borassus would naturally soon become a greater favorite even with respect to such a matter as the leaves for writing purposes in which it is perhaps hardly superior to the Corypha. But it is difficult to suppose that the employment of the Borassus leaves as a material for writing can be separated by any long interval from the introduction of the Borassus palm into India. The tree could not well have existed long in India without its useful properties being discovered. If the use of its leaves for writing grew up in the 15th or 16th centuries, its introduction can hardly be placed much earlier than the 14th century.

There is a notice in Hiuen Tsiang's Travels (Beal, vol. ii, p. 255) of the existence of "a forest of Tāla trees" near Konkanapura in South-India. The exact site of that place is still a matter of dispute (see *Indian Antiquary*, XII, p. 115, XXIII, p. 28); but it must be somewhere in the Concan, which is the limit to which the Corypha umbr. grows freely in *cultivation* (though not *wild*). The pointed notice of the "forest of Talipat palms" is curious. It must have been a particular feature of that place, and must have been shown to Hiuen Tsiang as such. In the forest there was a Stūpa; and Hiuen Tsiang adds that "in all the countries of India the leaves of the Talipat palm are everywhere used for writing on." Here we seem to have a clear instance of a plantation of Corypha palms, on a large scale, for the purpose of growing leaves for inland use or for export. Writing was mainly carried on in Buddhist and other monasteries, and probably there were Corypha plantations connected with most of the larger monastic establishments in South India; only the Konkanapura plantation would seem to have been one on a particularly large scale.

There is a puzzling notice in Alberuni (Sachau, vol. i, p. 171). He says: "The Hindus have in the South of their country a slender tree like the date and cocoanut palms, bearing edible fruits, and leaves of the length of one yard, and as broad as three fingers, one put beside the other. They call these leaves *tārī*, and write on them. They bind a book of these leaves together by a cord on which they are arranged, the cord going through all the leaves by a hole in the middle of each."

This description, with the exception of the remark about the edible fruit, only fits the *Corypha* palm. At the time of Alberuni (973–1043 A.D.) the *Borassus* palm, in all probability, did not exist in India. In any case, at his time its leaves were not used anywhere in India for writing books. He says the leaves measured one yard in length, and three fingers in breadth: that gives us a leaf measuring $36 \times 2\frac{1}{2}$ inches, which, as I have shown, are nearly the maximum measurements of a *Corypha* leaf, but impossible for a *Borassus* leaf.¹⁹ He also says that the leaves are called *tārī*. At the present day, the term *tārī* (ताड़ी) is used to denote palm-wine or “toddy,” which, of course, is made from the juice of the *Borassus* palm. I am not aware that the term is used anywhere for the prepared leaves of either the *Corypha* or the *Borassus*. These are called *Tālpāt* or *Tālīpāt*, and that term is applied to the *Corypha* palm in South India, and has been adopted into the Botanical terminology. In Alberuni’s use of the term *tārī* for the leaves, there appears to be some misunderstanding. But a greater difficulty is his remark about the edible fruits, as Alberuni is generally a careful observer and reporter. Personally he can have had no acquaintance with the tree, as neither the *Corypha* nor the *Borassus* grows in the localities where he lived: he can only have reported what he was told. But as the *Borassus* palm is out of the question, he must either have made a slip, or the text of his work is handed down incorrectly. As immediately before he had mentioned a point of resemblance to the date and cocoanut palms, he probably now wanted to point out a point of difference, that the *Corypha* palm bore no edible fruits; he probably meant to say “a tree, slender like the date and cocoanut palms, but bearing no edible fruits.”

Alberuni proceeds to say: “In Central and Northern India people use the bark of the *tūz* tree. It is called *bhūrja*. They take a piece one yard long and as broad as the outstretched fingers of the hand, or somewhat less (about 8 inches) and prepare it in various ways. They oil and polish it so as to make it hard and smooth, and then they write on it. Their letters, and whatever else they have to write, they write on the bark of the *tūz* tree.” There can be no doubt that Alberuni is describing the bark of *Betula utilis*. Where he lived, the tree was probably a well-known object to him. The measurements of the strips of bark given by him are borne out by the *Kharōṣṭhī* birch-bark

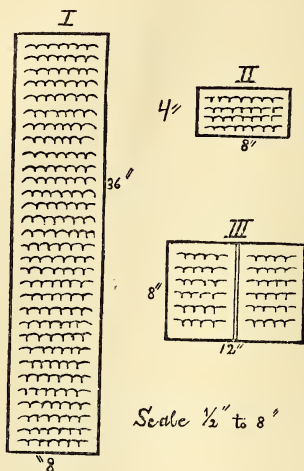
¹⁹ In the quoted passage it seems as if Alberuni were speaking of the size of the natural leaves of the palm. Obviously this is not correct; for the size of the segment of the natural leaf of either palm, whether *Corypha* or *Borassus*, is much greater. Possibly the translation may be at fault. Anyhow, Alberuni is speaking of the size of the prepared leaf.

manuscript of which portions are preserved in Paris and St. Petersburg,

and which may be as old as the 1st century A.D. The strips of bark on which this manuscript is written, measure about 8 inches (or 20 centimeter) in width and one yard, more or less, in length²⁰ (Woodcut, fig. 1). This seems to show that anciently the strips of bark were used in their full size, perhaps in the form of rolls, like Greek manuscripts of papyrus. Or their length was cut up into smaller pieces, of about 4 inches each. Such is the *Bakhshāli* MS., which measures about 7 by 4 inches. The latter probably belongs to the 10th or 11th century, *i.e.*, about the time when Alberuni lived; and

he may have been thinking of manuscripts of this kind, when he wrote his observations. The writing was made to run parallel with the narrow side of the original strip, as seen in the published plates of the Paris and St. Petersburg MS. This custom was retained, even when the strips were cut up into smaller pieces, as in the *Bakhshāli* MS. (Woodcut, fig. 2). The latter approaches, in its general form, the typical Indian palm-leaf *pothī*. It consists of a large number of separate oblong leaves, with the writing running parallel with the longer side of the leaf; only the oblong is not so decidedly elongated as in the palm-leaf, and the string-holes are wanting. Still later, after Alberuni's time, the modern book form appears to have been introduced. The strips of bark, cut into smaller pieces of about 12 inches, were folded in the middle, making up a "form" of two leaves or four pages; and the writing was now made to run parallel with the narrow side of the page, so that, if the form is unfolded into the original sheet or strip, the

²⁰ The exact length is uncertain. M. Senart has measured one of the length of 4 feet (or 1 m. 23), but states that the strips evidently vary in length. See *Journal Asiatique*, 1898. See also Professor v. Oldenburg's Report in the Transactions of the Imperial Russian Academy, for 1897. Woodcut, fig. 3 shows the exact measurements of a *Çarādā* manuscript in my possession, about 250 years old.



writing is seen to be in two columns and running parallel with the longer side of the strip as shown in fig. 3 of the Woodcut.

A noteworthy point in Alberuni's statement is that it seems to assert that, in his time at least, the use of birch-bark was peculiar to Central and Northern India, while palm-leaf was peculiar to Southern India. At first sight this assertion does not seem to be borne out by the evidence set out in the earlier part of this paper. Hiuen Tsiang also states explicitly that in his time (7th century) palm-leaf was used throughout India, and he travelled over the whole of India, and was in touch with the literary classes of India. All depends on the exact meaning of Alberuni's terms. That he cannot have included in his "Northern India" those portions which I have denoted Western and Eastern India is clear from the fact shown by my evidence that all the oldest manuscripts of those parts of Northern India, going back practically to the time of Alberuni himself, are of palm-leaf. There is no reason why birch-bark manuscripts should not have survived as well as palm-leaf manuscripts in the libraries of Pātān and Cambay, and elsewhere, if any birch-bark manuscripts had existed at all. That birch-bark manuscripts are quite capable of surviving for so long a time is proved by the Bower MS. Alberuni's "Northern India" must be limited to the Panjāb, Sindh, Rājputānā and Kashmir, and his "Central India" must mean the North-West Provinces and Oudh, or what I have called the "Centre" of Northern India. In fact, Alberuni's terms are bounded by about the 24th Lat. and 85th Long., and India below the 24th Lat. is what he designates "Southern India." Understood in this sense, his statement is probably quite correct. It is true the evidence available on the point is very scanty. The only three birch-bark manuscripts of any considerable age, which are known to have survived are (1) the Paris and St. Petersburg MSS., (2) the Bower MS., and (3) the Bakḥshālī MS. They all come originally from that portion of India which Alberuni includes in his "Northern India;" and—so far—they show that birch-bark was used there for book-writing. Nos. 1 and 2 are much older than Alberuni's time. No. 1 dates probably from the 1st or 2nd century A.D., the period of a still strong Greek influence, and its apparently roll-like form may be due to that influence. No. 2 dates from about 450 A.D., and is in the Indian Pōthī form, oblong, like the corypha leaf, with a string-hole.²¹ It belongs to a period of a still strong Buddhist intercourse between what Alberuni calls "Southern India" and Central Asia. This may account for its distinctly Indian Pōthī form. No. 3 probably dates from about the

²¹ The Bower MS. contains several distinct works, written on leaves of two distinct sizes, $11\frac{1}{4} \times 2\frac{1}{2}$ " and 9×2 ", but both imitating the Corypha leaf.

time of Alberuni himself. Its form is peculiar. It resembles the Indian *Pothī*, in consisting of separate leaves, not "bound" in a book, but tied together in a bundle: but it differs from the *Pothī* in not having any string-hole for the passage of the tying string. The string-hole was probably omitted as being too risky for the material. It also differs in its shape, being squarish ($7 \times 4''$), and not so distinctly oblong as the common Indian *Pothī*, made with the long narrow palm-leaves. Now it is noteworthy that the two oldest paper manuscripts known to us point to their having been made in imitation of such a birch-bark prototype as the Bakhshālī MS. The oldest paper manuscript, dated 1231 A.D. (*supra*, p. 121) has exactly the same squarish shape; it measures 6×4 inches. The next oldest paper manuscript, dated A.D. 1343, is rather more oblong, measuring $13\frac{1}{2} \times 5$ inches, but it has no string-hole. Both these manuscripts come from that part of India which Alberuni calls "Central India as above explained." It seems permissible to conclude that when paper came into use, its leaves were cut and treated in imitation of birch-bark book-leaves in those parts of India where birch-bark was the common writing material, and that it was cut and treated in imitation of palm-leaf, wherever the latter material was used for book-writing. In this connection it is worth noting that no old palm-leaf manuscripts are known to come from Alberuni's "Northern and Central India," though, considering the scanty survival of birch-bark manuscripts, too great importance may not be attached to this point.²² Regarding this point of survival, it may be noted that it applies equally to all kinds of manuscripts, whether of paper or of birch-bark or of palm-leaf. This circumstance shows that the cause of the non-survival is not to be sought in the climatic conditions of Alberuni's "Northern and Central India." These need not have prevented a reasonable amount of survival. The cause is probably rather to be sought in the political and religious troubles which so frequently convulsed those portions of India. During the Muhammadan conquest, for example, large destructions of Hindu literary works are reported to have taken place.

In this connection there is another interesting point to be noted. The Bower MS., which is written on birch-bark and is certainly as

²² There are a few very old palm-leaf manuscripts, but they all come from Western India; at least there is no reason to assume any other place of origin for them. They are enumerated in Table I, Nos. 1-5. No. 5 is dated by Mr. Bendall in the Harṣa era, and this might seem to suggest the "Centre" of Northern India as its place of origin. But, in the first place, the date may be, and as I believe is, more probably, referable to the Gupta era, in which case the date of the manuscript is A.D. 571-2. In the second place, considering the wide extension of the Harṣa empire, even a Harṣa date is not incompatible with a Western Indian origin which on general grounds is far more probable.

early as the middle of the 5th century, is fashioned exactly like the typical Indian Corypha palm-leaf manuscript. It consists of separate leaves, provided with a string-hole, and these leaves measure from 2 to $2\frac{1}{2}$ inches in width, which is the width of the Corypha leaf. But further, all the oldest paper manuscripts from Kuchar imitate the Indian Corypha leaf manuscripts, as may be seen from the specimens of the Weber MSS. and the Macartney MSS. which I have published. They all consist of separate, elongated oblong leaves, from $2\frac{1}{4}$ to $2\frac{3}{4}$ inches wide, with a string-hole, and with the writing running parallel with the longer side of the leaf. Everything points to the inscribed Corypha leaf as the model, not even to a Borassus leaf. The Bower MS. and those Weber and Macartney MSS. which are written in Indian Gupta characters must have been written by native Indians migrated to Kuchar, while the other Weber and Macartney MSS. written in the Central Asian modification of the Indian Gupta were probably written by native Kuchāris.²³ Why should the people of Northern India and of Central Asia have gone to the trouble of cutting up birch-bark and paper into the shape of palm-leaves, when both kinds of material more naturally lent themselves to other (square) forms, which for writing purposes one would have thought to be obviously more convenient than the long narrow strips of palm-leaf? What else could have caused this, but the sanction of immemorial usage among the literary classes of India, the learned and the "religious," those who occupied themselves with the composing and copying of books; and with the spread of Indian culture, through the Buddhist propaganda, its fashions of writing went with it beyond the borders of India. At the same time the circumstance that they imitated the oblong shape of the palm-leaf rather than the squarish shape of the birch-bark leaf clearly points to the conclusion that the writers of the manuscripts in question either came from Western India, or, at least, were influenced by the literary customs prevailing in that part of India—the part which is included in Alberuni's Southern India.²⁴

This suggests another thought. The Corypha palm is a South Indian tree. Its leaves established that immemorial and so strongly

²³ See my paper in the *Journal, A.S.B.*, Vol. LXVI, pp. 257, 258.

²⁴ This view is confirmed by the circumstance that the leaves of some of the Weber and Macartney MSS. are numbered on their obverses. This, as the late Professor Bühler has pointed out (see *Vienna Oriental Journal*, Vol. VII, p. 261), is a custom of Southern India. In Northern India the numbering is on the reverses. We thus seem here to come across a curious indication regarding the particular part of India from which the Buddhist propaganda proceeded to Eastern Turkistan. We should have to look for it in South-western India.

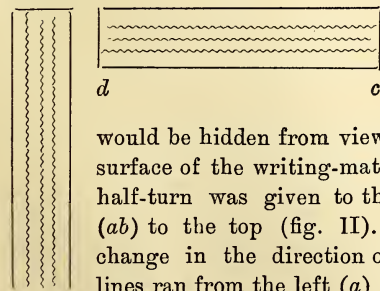
persistent fashion of shaping the writing material, even when it was birch-bark or paper. The people who used those leaves and thus initiated that fashion, must have been the first to learn and adopt the art of writing in India. The late Professor Bühler, in his excellent paper "On the Origin of the Indian Brāhmī Alphabet" (*Indian Studies*, No. III) and in his *Indian Palæography* (*Encyclopedia of Indo-Aryan Research*, Chap. I, § 4), has shown it to be most probable that the Indian Brāhmī script is derived from a Northern Semitic alphabet and he suggests that it probably came by way of Mesopotamia and the Persian Gulf. I agree with Professor Bühler; only I believe the original of the Brāhmī script to have been, not the Phœnician alphabet of the 8th or 9th century B.C., but the Proto-Aramaean of the 7th or 6th century B.C. All the trustworthy evidence, at present available, points to the conclusion that the maritime commerce of India with the West cannot have commenced before the 7th century B.C., and that it ran from the west coast of India through the Persian Gulf to Mesopotamia. At that time, there existed a flourishing land-trade between Mesopotamia and the further West through the North of Arabia. The Indian sea-trade connected with this land-trade. The latter had a script, common to all the peoples that participated in it, and it must have been this script with which the Indian merchants and mariners became acquainted in the 7th and 6th centuries B.C. This script which may be called the Proto-Aramaean, was a cursive development of the Phœnician, and owed its origin to the need of a popular short script by the side of the more cumbersome cuneiform. Further all available evidence seems to show that, though there probably existed a coasting-trade all along the west-coast of India to Ceylon, the Indian sea-trade to Mesopotamia started from the northern part of the west-coast, above Bombay, in the Gulf of Cambay, where the two ancient ports of Bharoch and Supārā, already mentioned in the Jātakas, are situated. It is here, in the north-western part of Southern India that the Brāhmī script must have originated, say, between 650 and 550 B.C. It was here that the Proto-Aramaean script was introduced by the Indian mariners, and elaborated into a new script by men belonging to the literary classes of India for the benefit, primarily, of the mercantile classes. These men would not have been slow to notice the advantage of the new importation, and they would naturally alter and enlarge it, and generally adapt it to the needs of their own language and literature. The details of this process of adaptation have been very well worked out by Professor Bühler in his papers above cited. But what I wish to point out is that the three principles on which Professor Bühler shows the adaptation to have been made are most easily accounted for, if we remember the nature of the

writing material to which the Proto-Aramaeian script had to be adapted. Professor Bühler accounts for them by “a certain pedantic formalism” of the Indians. But they are far more naturally accounted for by the fact that the South Indians adopted the Corypha palm-leaf to write upon, and took to the fashion of scratching their letters on them. Why they should have chosen palm-leaves and the method of scratching on them, is another question which it would be interesting to explain. But anyhow, as a matter of fact, they did make their choice in that way. And having done so, the principles above referred to followed almost as a matter of course. Considering the venation of the palm-leaf (cross-veins running at right angles with the length of the leaf), one could only scratch letters with comfort on them, if they were made “of vertical lines with appendages attached at the foot” instead of the top, and “set up straight.” Considering the extreme narrowness of the palm-leaf (about $2\frac{1}{2}$ inches at most), admitting only a very small number of lines, the letters had to be “made equal in height,” lest space was wasted.

In connection with this another point comes in. The Semitic script runs from the right to the left, while the Brāhmī runs from the left to the right. So far as I know, it has never been satisfactorily explained what could have induced the Indians to introduce the change. The boustrophedon method of writing which is supposed to account for the same change of direction in Greece, will not serve as an explanation; for that method has never been observed in any Indian inscription, nor is it ever noticed in Indian tradition. I should like to suggest the following explanation. The original writing material of the Indians were very narrow oblongs: bamboo-slips or palm-leaves. On these they probably wrote (as also the Chinese do) originally invertical lines, parallel with the longer

d I *a a* II *b* side, (*ab* in fig. I) and running, after the Semitic fashion, from the right (*a*) to the left (*d*), every letter also facing left. With this method of writing the earlier-written lines

would be hidden from view by the hand as it moved across the surface of the writing-material. To avoid this inconvenience, a half-turn was given to the latter, so as to bring its longer side (*ab*) to the top (fig. II). The consequence was a complete change in the direction of writing; for now the letters on the lines ran from the left (*a*) to the right (*b*), and the lines from the top (*a*) to the bottom (*d*), parallel with the longer side (*ab*) as shown in fig. II. This is precisely the way in which all existing Indian *pothis* are written. By the half-turn, given to the



c b

material, all the letters written on it would also be placed on their sides, and to obviate this inconvenience, they were again set up straight, but now usually facing in the opposite direction. The original practice of vertical writing may have had a cause similar to that above suggested for the half-turn of the material: or it may have been due to the inconvenience of frequent breaks of continuity in writing extremely short horizontal lines (parallel to *ad* in fig. I).

This paper was read to the Society in May 1898. Its publication was delayed, in the hope that I might be able to add the results of an enquiry into another source of evidence. But as my work on the British Collection of Central Asian Antiquities will prevent this for some time, it seems better to present the evidence as it stands at present, especially as it is of such a direct and reliable character. The other source I refer to is the occurrence of the names of the Corypha and Borassus palms respectively in ancient Indian literature. When the date of an ancient work is known, exactly or approximately, one would suppose the occurrence in it of the name of the palms should be a proof, first, of their existence in India at that time, and secondly, of the use of their leaves as writing material. This seems a perfectly sound assumption, but there are several pitfalls to be guarded against: (1) is the date assigned to the work reliable; (2) is the passage in which the name occurs genuinely old, or possibly a later interpolation; (3) is the application of the terms to the palms in question certain? I have not been able to spare time for the examination of this source of evidence; but I may just mention a few instructive cases to illustrate its difficulties.

(1) Professor Hara Prasad Shastri has drawn my attention to a passage in the *Lalita Vistara* (Bibliotheca Indica Ed., p. 526, l. 12), in which the fruit of the *Borassus flabellifer* is supposed to be referred to. As the *Lalita Vistara* certainly existed as early as the 3rd century A.D. (having been translated into Chinese in 308 A.D.), we should thus have a testimony to a very early existence of the Borassus palm in India. The passage runs as follows: *tad-yath=āpi nāma Tāla-phalasya pakvasya samantantaravṛṇṭa-cyutasya bandhan-āçrayaḥ pita-nirbhāso bhavati , evam=eva Bhagavato Gautamasya pariçuddhvaṁ mukha-maṇḍalam, etc., i.e.,* "Just as the exocarp of the ripe fruit of the Tāla palm, when it drops from its stalk, is of a brilliant yellow, even so is the face of the Blessed Gautama perfectly pure." On referring this passage to Dr. Prain, I received the following reply: "My only objection as a botanist to the identification of *Tāla-phala* with either the Tāla or Tālī palms, *i.e.*, with either the Borassus or the Corypha, is that the *bandhan-āçraya* (exocarp)

of both is *anything but* 'brilliant yellow.' The fruit of *Borassus* is 'rusty brown,' that of *Corypha* 'grey,' when they have respectively dropped from the stalk. Of course, there is a Palm, and that too one which is undoubtedly a native of northern India, with fruits that when ripe *do* most thoroughly deserve the description 'brilliant yellow.' This is the *Kajūr* or wild date. The difficulty then, of course, is the name; was *Tāla* ever commonly applied to what is now more generally known as *Kajūr*? I find that Dr. Watt has been informed (see his Dictionary under *Phoenix dactylifera*, the Date, and *Phoenix sylvestris*, the wild date, which is not really botanically separable from the cultivated tree) that in Sind, where, by the way, according to Mr. James and Mr. Strachan *Borassus* is not grown, one of the names of *Phoenix dactylifera* is *tār* to this day, and that in the Panjāb the name *Tārī* is still applied to the juice (taken to make Toddy) of the wild date, *Phoenix sylvestris*." This seems to me to speak for itself, and shows the necessity of caution in dealing with botanical terms occurring in old Indian literature.

(2) In the Introduction to the *Jātaka* book there occurs the following passage: *puratthābhimukho nisiditvā ekatthitāla-pakkappamāṇe ekūnapaññāsa piṇḍe katvā sabbaṃ appodakaṃ madhupāyāsaṃ paribhūñji*, i.e. (as translated by Mr. Warren in his *Buddhism in Translations*, p. 74) "setting down with his face to the east, he made the whole of the thick, sweet milkrice into forty-nine pellets of the size of the fruit of the single-seeded palmyra-tree, and ate it." The meaning, of course, is that Buddha ate the milkrice in 49 mouthfuls. The passage occurs in the story of the dish of milkrice which was given by *Sujātā* to Buddha shortly before his enlightenment. I referred this passage to Sir George King who replied "the fruit of *Borassus* is too big to be likened to the ball which a native of India makes up when he eats rice. So I presume *Corypha* must be the species of *Tāla* meant. Its fruit is small, globular, and not longer than a walnut. The fruit of the Palmyra is of the size of a closed human fist or a cricket-ball." Measured by it the milkrice, and the "mouthful" would have been an enormous quantity. By the way, the expression "single-seeded" is curious. The rule with all palms is a single seed. The only Indian palm, which, as Sir George King informs me, has occasionally two seeds in its fruit is the *Caryota urens*, which is common enough in India and Ceylon. If the writer of the Introduction to the *Jātaka* book knew that the *Caryota* had sometimes two seeds, it would explain his applying the term "single-seeded" to the *Corypha*.

(3) There is a well-known passage in Arrian's *Indica* (Ch. VII), in which Megasthenes is quoted as saying: "They (the Indians) eat the inner bark (*φλοιός*) of trees; the trees are called in the speech of the

Indians *tala*, and there grows on them, just as on the tops (κορυφή) of the date palms (φοίνιξ), something like balls of wool" (οἶάπερ τολύπας). It is commonly assumed that the *tala* tree is the Borassus, and that the "something" means its fruit. But Megasthenes cannot have referred to the fruit of the tree; he clearly meant something, the nature of which he did not know; it was neither fruit nor flower, but could only be described by its resemblance. Anyhow the whole description of the tree fits neither the Borassus nor the Corypha palm. The only Indian palm which agrees with some items of the description is the *Caryota urens*. The pith of it yields sago; and tufts of a kind of woolly stuff grow at the points where the leaves join the stem (see Yule's *Friar Jordanus*, p. 17, Hackluyt Soc., 1862). These may have been intended by the "inner bark" and the "something" of Arrian. But neither the tufts, nor the fruit of this palm—and, indeed, of any palm—grows on its "top," and the reference to the date-palm remains unintelligible.

One thing is clear. The common assumption in all the dictionaries (Sanskrit or Pali) and translations that *tāla* always means the Borassus or palmyra, and *tālī* the Corypha, is quite unfounded. *Tāla* is simply the generic name of any palm, and the context must show which palm is intended in any particular case. This is certainly the case with the older Indian literature, whatever the modern usage may be.

With reference to page 124, I may now add that the earliest evidence that I can find of the existence of the Borassus palm in India, occurs in Friar Jordanus' *Mirabilia descripta*, in 1328 A.D. He calls the tree *tārī* (or *tālī*), and says that it "gives all the year round a white liquor pleasant to drink." (See Yule's *Hodson Jobson*, s.v. Toddy). The reference to the "toddy" shows that the Borassus palm is meant.

